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PROSTATECTOMY WITH COMPLETE CLOSURE.

By S. HARRY HARRIS, M.D., Ch.M. (Sydney), F.A.C.S.,
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THE subject of complete closure of the bladder after prostatectomy has occupied a prominent place in the minds of urologists for a considerable time and periodically spasmodic efforts have been made to elaborate a successful technique, hitherto without avail. For a number of years at my hands this has formed an intensive study and has been the subject of much experimentation. Two desiderata have always been kept in mind: (i) the reformation of the prostatic urethra, more particularly of the floor, (ii) the complete control of hæmorrhage by ligation or suture. Each of these difficulties has in turn been overcome. By gradual evolution a technique has at length been standardized in my hands and practised successfully for the past eleven months. During this period forty-four consecutive patients with benign prostatic hypertrophy have been so treated by me without mortality.

The technique includes the placing in the prostatic bed generally of five catgut sutures, providing for reformation of the floor of the prostatic urethra, complete control of hæmorrhage and obliteration of the prostatic cavity. Special instruments have been developed and are necessary for the placing of these sutures. The entire operation takes on an average thirty to thirty-five minutes, but the increase in time is more than compensated by the complete control of hæmorrhage.

Convalescence has been extremely easy and in the great majority of cases uncomplicated. The catheter, Number 22, French, which is kept in position by a special device, is removed on the tenth day. Spontaneous micturition follows. In most cases there is no urinary leakage whatever; occasionally a few drops for twelve to twenty-four hours after removal of the catheter. One patient after remaining perfectly dry while the catheter was in position, discharged all the urine suprapubically for four days after its removal. The fistula then closed.

In two early cases secondary hæmorrhage demanded suprapubic drainage for two and three days at the seventh and tenth days respectively. It

is believed that these were due to minor faults in technique which have since been rectified. There was no case of reactionary hæmorrhage nor is there any more reason for it than after a hysterectomy, when the technique has been properly carried out. The main features of the operation are explained by the illustrations and the accompanying legends. Fuller details will be published at a later date.

ELECTRIC IONIZATION IN OTO-RHINOLOGY.¹

By A. J. CAHILL, M.B., Ch.B. (Melbourne),
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PROFESSOR LEDUC, of Nantes, and his pupil, A. R. Friel, of London, established on a scientific basis

the principles underlying the sterilization of suppurating cavities by driving in metallic "ions" by means of an electric current. As often happens, subsequent workers have not always kept constantly in mind the principles involved and consequently the limitations of the method; however, the successful treatment of certain diseases of the nasal accessory sinuses and of the ear by electric ionization is now an established fact. Friel himself has been largely responsible for the position this form of treatment holds in therapeutics today and much excellent work in this promising

EXPLANATIONS OF FIGURES IN THE PLATE.

Figure I.

Technique for reformation of the floor of the prostatic urethra, obliteration of the prostatic cavity and complete control of hæmorrhage after prostatectomy.

(i) Illustrates the first three sutures placed posteriorly, before they are tied, namely the central crown or reconstructive suture and the two lateral hæmostatic sutures.

(ii) Illustrates the same after they have been tied, showing the tongue-shaped flap of trigone pulled down into the prostatic cavity and reforming the floor of the prostatic urethra.

(iii) Illustrates the two deep anterior transverse sutures for obliteration of the prostatic cavity, one tied and the other loose.

(iv) Illustrates the plastic operation complete. There is complete control of hæmorrhage.

Figure II.

Showing the mobility of the prostatic capsule, the discovery of which made the operation possible. A-B = the track of the crown suture, the tying of which approximates the points A and B and reforms the floor of the prostatic urethra.

Figure III.

Completed operation. Shows glass rod to which the urethral catheter is anchored by a loop of silkworm gut. The operation area is half size, but the body is not drawn to scale.

field is also being done by such men as Jobson in England, Norrie in Calcutta, and Campbell in Johannesburg.

I first became interested in ionization about 1912, after reading an article by Friel in *The British Medical Journal* on "Zinc Ionization in Tympanic Sepsis." Friel was at that time practising in Johannesburg and shortly afterwards I purchased an interesting little book that he had written, entitled "Obiter Scripta," in which he strongly advocated electrolysis of the inferior turbinates by means of a zinc needle as a far better method of shrinking the nasal mucous membrane than by means of the electric cautery.

Before I was able to take up ionization treatment seriously in my special practice the war broke out

¹ Read at a meeting of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association on July 24, 1928.

in 1914 and in 1915 I left on active service. At Abbeville, in France, I met Friel who had recently arrived from Johannesburg to fill the position of Aural Surgeon and Bacteriologist to the South African Expeditionary Force. Friel had already established a splendid ionization department at Number 1 South African Hospital and I was so impressed with the excellent results that he was getting in chronic middle ear conditions and diseases of the accessory sinuses of the nose that I decided to spend a couple of hours with him every morning until I was able to master the whole of his ionization technique.

When I returned to Australia in 1918 and took up my special practice again in Lismore, New South Wales, I ordered a complete ionization outfit from London and New York and have been using this excellent method of treatment ever since, both during my last nine years' residence in Lismore and since I went to Canberra nine months ago.

It would be impossible in a paper of this length to cover the whole field of ionization treatment in oto-rhinology, but it has been my aim to deal with some of the more important phases of it and to make my paper as practical as possible by describing at some length the actual details of the technique to be carried out, if successful results are to be obtained.

EQUIPMENT.

Sources of Current.

The sources of supply of a continuous galvanic electric current which are available for treating patients by ionization are: (i) The electric light and power mains, if they supply a direct current, (ii) a battery of accumulators, (iii) a battery of dry or wet cells, (iv) small dynamos.

The electric current from the mains can be utilized through the medium of a wall plate or a multostat and when the supply consists of alternating current, the latter can be used to work a small motor-generator. This consists of an alternating current motor and, mounted on the same shaft, a continuous current dynamo delivering a suitable voltage (fifty to sixty).

Accumulators (especially if the cells are of large size) connected in series and sufficient (say fifty) in number to yield one hundred and twenty volts, give a very steady current and are eminently suitable for a hospital ionization department. The amount of current which can be withdrawn, is quite sufficient to treat several patients at the same time.

A battery of large Leclanché wet cells (or an equal number of dry cells), connected in series, will give a sufficient amount of current for use in the consulting room to treat one patient at a time. A dentist or aurist will obtain ample current for his purpose with from eight to ten cells. A nasal surgeon will require somewhat more, say fifteen, while for general medical, surgical or gynaecological work a battery of thirty to forty cells will be requisite.

In ionization work the two important instruments for measuring the dosage are the milliampère-meter

and the watch, the factors taken into account being the amount of current and the duration of the treatment.

Testing of Electrodes.

A simple method of testing the electrodes to find out which is positive is as follows: Pour a little iodide of potash solution on a piece of filter paper. Then touch the filter paper with the ends, 1.25 centimetres (half an inch) apart, of two wires connected with the poles of the battery. A brown iodine mark appears where the positive pole touches the paper and at the negative pole there is nothing.

The electrode which is applied to the part to be treated is called the "active" electrode. That used to complete the circuit and applied to some other part of the body (such as the wrist), is called the "indifferent" electrode.

Time.

The time at which a patient begins to receive the current, should be jotted down. Otherwise, when several patients are being treated, one is apt to get confused as to the duration of each patient's treatment. The time is often considerable and if many patients have to be treated, it is necessary to arrange for two or more to have treatment simultaneously.

Arrangement of Room.

The room devoted to ionization in a hospital should be fairly large. It is necessary to provide three or four regulating apparatus and these should be placed where accidental interference with them is not likely to happen, for example on a convenient shelf on the side of the room away from the door. The conductors or wires, leading to the patient from the terminals of a regulating apparatus, should pass upwards to the ceiling and hang over an operating table or couch. The cord attached to the positive terminal should be distinguished by colour or by a knot from the one attached to the negative. It is also a good plan to allow one to hang five centimetres (two inches) lower than the other so as to avoid the possibility of making a short circuit and injuring the milliampère-meter owing to the metal terminals or screws touching one another.

As ionization is suitable for the treatment of many septic conditions, it is quite well that the room devoted to the ionization of surgical conditions should be furnished like an operating theatre. Simple forms of operating tables upon which patients can lie, should be provided; and, as frequently portions of the patient's clothing have to be removed, the room should be warm. The personnel required is the same as for most minor aseptic operations—a surgeon, a sister and a probationer. The treatment of surgical conditions by ionization is to be regarded as an operation and needing the same scrupulous asepsis and attention to details as any other operation. The operator should do the ionization. There is a pitfall, fraught with possibilities of failure to obtain a speedy cure for our patients, which may be expressed as "dual control." There is a tendency in hospital work to send a

patient to a special department to have him submitted to ionization; the patient for the time being passes away from the doctor who has been treating him and who knows his condition, to come under the control of somebody else, possibly unqualified, who has neither responsibility for him, nor the requisite knowledge of his condition. To realize the position clearly is to see clearly how to avoid it. The possibility of responsibility being shifted from the medical officer in charge of the case is bad from the patient's point of view and allows "slackness" to develop and precious time to be wasted in dealing with our foes, the microorganisms. It is for the benefit of the patient that he who does the surgical part should do the ionization also. Dual control of a patient is illogical.

Solutions.

Certain solutions, preparations and other articles should be kept ready in the ionization room. The solutions can be kept in a concentrated form and diluted with warm water when required.

1. Zinc sulphate 5 grammes (75 grains), glycerine 57 cubic centimetres (2 ounces), water to 1,000 cubic centimetres (35 ounces). Dilute with an equal quantity of warm water.

2. Sodium salicylate, 2%, in water or 175 grains to a pint. Dilute with an equal quantity of warm water.

3. Common salt, 2%, in water or 175 grains to a pint. Dilute with an equal quantity of warm water.

It should be noted that when making up solutions for use in ionization we should make them weak to minimize irritation. This is specially important when dealing with such sensitive tissues as the nasal mucous membrane. But if the solution is very weak, it is far from being isotonic with the blood and the osmotic changes which would take place between the solution and the contents of cells, would damage surface epithelium. To avoid this Professor Leduc directs that there should be added to the solutions used in ionization, when necessary, a non-electrolytic, such as glycerine, so as to make the solution isotonic with the tissue fluids and to avoid damage to the cells through osmosis. The above solution of zinc sulphate has been used repeatedly with satisfaction. It does not deteriorate on being kept and is of suitable strength for use in all ionization treatments. The ions of the heavy metals coagulate the tissues and form with some of their constituents more or less insoluble precipitates. Of the metals iron, copper and zinc, the ion of zinc exercises the greatest coagulative power on fluids containing albumin and it is in virtue of this effect that it is of such value in sterilizing wound surfaces, in producing sloughing in warty growths, in arresting hæmorrhage from the uterus and securing shrinkage of the soft mucous membrane covering the inferior turbinates. Professor Leduc says of zinc:

This ion is an antiseptic of the first rank and there is no wound or ulcer which cannot be sterilized by its employment, provided its surface can be reached by the electrode. One of its peculiarities is that it provokes but little inflammatory reaction. When I have experimented

with zinc upon the skin of animals and have caused superficial or even deep ulceration, I have observed that the wounds produced show no inflammatory effect or sign of infection from germs, even if they are completely uncovered; on the contrary, they remain aseptic, so that it appears as if the ions of zinc which they contain serve as the best possible of antiseptic agents.

Clinical observation has shown that as a result of ionization with zinc it is possible to bring about a rapid and complete subsidence of suppuration in acute abscesses, maxillary sinus disease, middle ear inflammation and various other septic conditions of the body. The surgical treatment of infection has hitherto usually consisted in the removal of the infected areas and material. The surgeon's mode of attack against the infecting germs has been of necessity indirect rather than direct. By ionization with zinc the surgeon is able to attack the germs *in situ*. The active sterilization by an extraneous agent of the deep layers of the walls of a wound or abscess cavity is possible. Under the action of the zinc ion these, together with the germs, are coagulated. Unlike a coagulation which would result by the action of corrosives or caustics, there is a minimal inflammatory reaction when zinc ionization is used.

In ionization with zinc the exudation and germs are penetrated and permeated with the zinc. They are "fixed" and the fixation causes the death of the germs. The tissues forming the walls of the wound can also be penetrated to any desired depth. Contiguous tissues are not irritated. The coagulated layer which is formed, is sterile and intervenes as a barrier between the healthy tissues and the exterior. Exudation into the wound is reduced and "physiological rest" is given both to the patient and to his tissues. The healing energies, not having to deal with the invading microbes, rapidly repair the structural damage. The contrast between a slide made from a septic ear before ionization and on the day following is remarkable. The first may contain numbers of bacteria, in the second it may be difficult to find even one.

Ionization with zinc is, I believe, the ideal treatment for many forms of chronic middle ear suppuration and for uncomplicated simple empyema of the frontal, maxillary or sphenoidal sinus. The technique to be followed in the application has for its aim the treatment of the whole of the infected surface. Care to insure this is essential to success.

CONDITIONS SUITABLE FOR TREATMENT.

Conditions suitable for treatment by ionization are chronic middle ear suppuration in which the perforation is large enough to allow fluid to run into the middle ear and in which there is no extensive bone disease or mastoid trouble; in the nasal sinuses, empyema of the antrum, when there is no concomitant disease of the ethmoid or polypi or diseased bone in the walls of the cavity; empyema of the frontal or sphenoidal sinus without coexisting suppuration in the ethmoid cells.

If there is a raw surface, the current will by preference enter there and spare the rest of the

cavity. The presence of granulations and raw surfaces produced by operation diminish the likelihood of success. Speaking generally, zinc ionization is specially indicated where we have an infected cavity which is badly drained. Treatment by ionization and by vaccines is not contradictory, but supplementary. We know that the presence of a well containing putrefying fluid renders treatment by vaccines useless. It is in these cases that treatment by ionization is of so much help. One application may be quite sufficient to cure completely a case of chronic middle ear or maxillary antrum suppuration. If great improvement does not follow the first application, the probability is that the diagnosis was insufficient or that the method of application was faulty.

X ray photographs and the interpretation of them by an expert will be of help in diagnosing ethmoid disease. More care in application may remedy the second fault.

Friel quotes a case in which a patient of his had both antra involved. The right antrum was ionized first and was quite well next day and remained so. The left antrum was ionized on the following day without improvement and so on several subsequent occasions. Thinking over what could be the cause of this, it occurred to him that possibly there might be an anatomical recess into which the fluid did not reach, so the patient was treated sitting up and then lying down. He was quite well next day and has since remained free from any antral trouble on either side.

If great improvement, but not complete cure follows ionization, the treatment can be repeated in a week or ten days. If no improvement follows, diagnosis and method of application should be revised. A striking fact about ionization is that one application may cure. If the whole of the infected surface has been ionized, improvement, one might say, must follow.

DETAILS OF TREATMENT.

Details which are common to all ionization procedures are the application of the indifferent electrode and the turning on and off of the electric current.

Size of Electrodes.

At the part of the body where the ions with which we wish to treat the patient are introduced, we try to concentrate the current and to limit it to the part affected, but at the indifferent electrode where the circuit is completed, we diffuse the current over a large area, using a large electrode so as to reduce the concentration, thereby avoiding irritation of the skin and minimizing any feeling of pain or sensation of burning. The skin where the electrodes are to be applied should be cleaned with ether and then inspected to see if there is any abrasion. If there is, a small piece of rubber plaster or a drop of collodion should be applied to prevent the current entering at that spot and perhaps causing a burn. The metal of the electrode should be separated from the skin by a thick layer of tissue (for example, sixteen layers of lint for an hour's exposure). The tissue (lint or folded towels) should be wrung out of hot saline solution and applied smoothly without

wrinkles to the skin. The whole is bandaged to the body, care being taken to exert an even pressure, especially over any bony prominence, otherwise a burn might easily result. For the same reason wrinkles in folded towels and uneven bandaging are to be avoided. The towels or lint should be applied wet, but not dripping wet. As the current enters the skin principally through the glands, it will enter more easily if these are active, so it is well to apply the towels hot.

Strength of Current.

In all cases the current should be turned on when the maximum amount of resistance offered by the rheostat is in circuit. This resistance should then be gradually and slowly reduced till the current flowing through the patient reaches the desired amount. When the current has acted for the required time, it should be reduced gradually and slowly and then turned off.

Extent of Area.

Ionization, as used in medicine and surgery, is as a rule strictly a local treatment and therefore it should be applied to the whole of the affected area. It does not do to ionize nine-tenths of an infected wound and leave one-tenth to reinfect the rest. The possibility or otherwise of treating the whole area is the main indication as to the suitability or not of this method of treatment in any particular case.

Factors Involved.

Before deciding to treat a patient by ionization it is advisable to pause to consider what are the component factors of the patient's present condition. In a septic area, for example, we may ask: "Are the tissues infected by a bacterium?" "Are they irritated by a well of putrefying discharge?" "Is this well mechanically accessible in its whole extent?" If the tissues are infected, treatment by a vaccine or serum is rational; if there is a putrefying discharge as well, it is also rational to wash this out, fill the cavity with zinc solution and ionize the surface layers of the wound. If it is a simple cavity, there is no great difficulty in this, but if the cavity is tortuous and compound, it will probably be advisable before ionizing to undertake some operative procedure to make the cavity simple and accessible. It is, in short, necessary to analyse the patient's condition, to decide what are the factors responsible for his symptoms and to recognize which are primary and which are secondary. At the same time it must be remembered that what is secondary in point of time, may be primary in preventing the restoration to normal and what is primary in point of time, may have long ceased to exist. Having decided regarding component factors, it is often necessary to treat all the existing factors simultaneously, using a method to cope with each. A plurality of treatments is thus not only rational, but may be necessary.

The following instructive case, quoted by Friel, will serve to illustrate the application of ionization to the nasal sinuses:

A man, aged forty, suffered from empyema of both maxillary antra, both ethmoids, both frontal sinuses and one sphenoidal sinus, with an abscess in the orbit communicating with one frontal sinus. His teeth were very septic and were probably the starting point of the nasal trouble. They were first extracted and the antra opened through the inferior meatus on each side and the ethmoids curetted. As it was now easy to pass a catheter into each frontal sinus, it was decided to ionize both. Each side was ionized twice, at a week's interval, and the discharge ceased. At the same time an autogenous vaccine was given. The sphenoidal sinus alone remained. Owing to the extra room in his nose following the operation on the ethmoids, it was a simple matter to introduce a cannula through the ostium, wash out the sinus with zinc solution and ionize it. Suppuration in it ceased at once. The patient was seen a year afterwards; there had been no recurrence of his trouble and his health was excellent.

Thus, a case of definite pan-sinusitis was permanently cured in two weeks by ionization which under the usual methods of treatment might easily have dragged on for many weeks or even months before the patient obtained permanent relief from his troublesome condition.

THE NASAL CAVITIES.

The uses of ionization and electrolysis in the nasal cavities are manifold and the following conditions can well be effectively treated by either or both of the methods: Epistaxis, bleeding polypus on the septum, hypersensitive areas on the septum (causing hay fever and asthma), swollen inferior turbinates, polypi and polypoid enlargements of the middle turbinates, synechia, acute or chronic empyema of the maxillary antrum, disease of the ethmoid labyrinth, empyema of the sphenoidal sinus, vacuum frontal headaches and subacute and chronic frontal sinusitis.

Ionization with salicylate of soda is also a valuable method of treatment in trigeminal neuralgia and in supraorbital neuralgia caused by the supra-orbital nerve being compressed in scar tissue after the radical operation on the frontal sinus or from a lacerated wound involving the same area. Zinc ionization is also an excellent method for small rodent ulcers on the face or ears and Professor Leduc has found ionization with salicylate of soda a most valuable method of treatment for various functional disturbances and organic conditions in the brain itself, whether due to anxiety, worry or traumatism, such as concussion, hæmorrhage or embolism. He discovered that the brain tissue is an excellent conductor of electricity and as the current tends to flow through it rather than along the bones of the skull, the "ionic changes" (a more accurate expression than the "current") which take place between the brain cells and the fluid surrounding them, promote nutrition. This nutritional change on the cerebral substance can be combined with a similar and also a soothing influence on the superficial nerves by soaking the negative electrode applied to the forehead in a solution of salicylate of soda. The fact that these nerves are soothed, tends also to give rest to the brain cells with which they are connected.

The details of technique which have been worked out and perfected by Friel, Norrie, Jobson and

Campbell, will be found very satisfactory in applying ionization or electrolysis within the nasal and aural cavities. They are described in the list of books and journals given at the end of this article.¹

Advantages of Ionization and Electrolysis.

Ionization will quickly sterilize a sinus, particularly the maxillary, when the sinus alone is infected. One or two applications only are necessary and they cause the patient little or no inconvenience and save him from operative interference. There is no daily lavage and no spraying is required.

Electrolysis is an absolutely safe method of treatment, especially when used in the ethmoid region, as the needle tracks are automatically sterilized and the spread of infection is thus eliminated. A sterile slough with sealed blood and lymph vessels is left. The operation can be viewed throughout, as there is no bleeding during the operation. There is usually some little ooze for twenty-four hours, but this is infinitesimal when compared to that following any operative interference in the nose. No nasal packs are ever used, a small pledget of cotton wool only being placed in the vestibule to absorb secretions and changed as often as necessary during the first few hours following treatment.

Any area may be attacked either piecemeal or as a complete operation, as far as possible at one sitting. The former method is to be preferred, since only visibly diseased tissues are then destroyed and patients are not caused more than temporary discomfort or inconvenience. It is not necessary that they remain off work for more than a few hours, even after an extensive electrolysis.

Campbell's Technique.

Before leaving the subject of ionization in the nasal cavities, I should like to refer briefly to Campbell's new technique which he described in the February number of this year's *Journal of Laryngology and Otology*, and which renders unnecessary the use of a small rubber balloon to block up the post-nasal space, as recommended by Friel, in order to keep the nose full of the ionizing solution and at the same time prevent it from running down the throat and making the patient swallow or cough. In actual practice Friel's method is extremely difficult to carry out successfully, because of the following facts: (i) The introduction of a small balloon into the post-nasal space is distinctly unpleasant to the patient and requires a local anæsthetic in nearly all cases. (ii) The patient is uncomfortable during the treatment because of the presence of the inflated balloon in the naso-pharynx. It creates a desire to swallow and it is almost impossible to prevent the solution trickling past the balloon, no matter how firmly the naso-pharynx is blocked. (iii) There is a real danger of liquid passing into the Eustachian tubes during the treatment and causing an *otitis media*. It is probable that the difficulties described have been experienced

¹Dr. Cahill gave full details of these methods. They have been omitted owing to lack of space.

by all who have given Friel's method a careful trial, and they also probably explain why nasal ionization is usually neglected by the majority of specialists.

I have used Campbell's technique for the past six months with complete satisfaction and it can be employed in the most nervous patients without difficulty or undue discomfort.

The patient is placed on a couch in the prone position with the forehead resting on a head-rest while the chest is at the edge of the couch. A space of about 22.5 centimetres (nine inches) then intervenes between the forehead and the upper part of the sternum. In this position the anterior nares are at the lowest part of the nasal passages, while the posterior choanae and the sphenoidal sinuses are at their highest. If we now proceed to plug one nostril with plasticine and then introduce through it a Eustachian catheter, we may fill that side of the nose with a solution which will escape round the posterior end of the septum into the opposite side of the nose and flow out of the nostril.

A straight metal catheter, such as a sphenoidal sinus cannula, is insulated by means of a thin rubber tubing almost to its distal end, round which plasticine is moulded, so that about six millimetres (one-quarter of an inch) of insulated catheter project beyond. The active electrode is attached to the proximal end of the catheter. With a little experience it is easy to estimate the amount of plasticine required to block the nostril completely. The catheter point and plasticine are introduced into the nostril, care being taken that the bare metal tip of the catheter does not press against the septum, otherwise a localized burn may result. A little manipulation will mould the plasticine to the shape of the nares and the smearing of a little sterile vaseline on the surface of the plasticine will make the join completely watertight. An irrigating can of the "Thermos" flask type [that will keep the ionizing solution at an even temperature of about 46.1° C. (115° F.) for half an hour] is placed about a foot above the patient's head and is connected to the catheter by means of rubber tubing. The flow from the douche can must be controlled by means of a tap or screw. The solution (either zinc sulphate or 2% saline solution) is now allowed to run into the nose so that it fills up one side and overflows continuously into the other to escape into a basin placed on the floor. The current is turned on slowly up to ten or fifteen milliampères and the treatment completed after whatever interval is desired.

In actual practice the following technique is adopted:

1. The insulated catheter is moulded with plasticine and the latter smeared with vaseline.

2. With the patient lying supine on the couch, the plasticine and catheter are introduced into the nostril. A little manipulation moulds the plasticine to the shape of the nostril.

3. The patient now turns to the prone position and rests his head on his left forearm on the head-rest and makes himself comfortable.

4. A piece of narrow tape is passed through the loop of the catheter and fastened round the neck to prevent it from slipping out of the nose and to support the weight of the electrode and rubber tubing which are attached to the catheter.

5. The tubing is attached to the catheter and the solution turned on so that it fills one half of the nasal cavity and overflows drop by drop into the other. A basin is placed below the overflow. The indifferent electrode is fastened to the right wrist, the active electrode is connected to the catheter with a screw or spring clip and the current turned on. The catheter acts as electrode and cannula combined.

By this method only one half of the nose can be filled with ionizing solution at a time, but each may be treated in turn. The only cavity which cannot be filled by this method is the sphenoidal sinus; but this cavity can be ionized in the supine position without blocking the naso-pharynx and, moreover, the sphenoidal sinus is fortunately the least prone to disease of all the accessory nasal sinuses.

Obviously, without adequate drainage into the various sinuses it is not possible to use any method of ionization successfully and Campbell's technique is chiefly useful in post-operative treatment. In the prone position, if the antrum, frontal sinus and ethmoids are well drained into the nose, the solution must flow in and fill up each of these spaces. After the radical antrum and radical frontal sinus operations ionization is of the greatest benefit in bringing about a speedy recovery. Zinc ionization is indicated after the removal of nasal polypi and this is also successful in clearing up post-influenzal rhinitis without involvement of the sinuses to any pronounced degree. Chlorine is used for the majority of post-operative conditions. Latterly bismuth has been used for hay fever, but it is rather early yet to give any opinion of its result, though the immediate effect is favourable.

THE AURAL CAVITIES.

In the aural cavities the following conditions can be effectively treated by ionization: Furunculosis in the meatus, chronic eczema of the meatus, chronic *otitis media* and post-operative mastoid wounds and cavities.

Furunculosis.

Furunculosis of the external auditory meatus, as everyone knows, is an extremely painful condition and owing to its liability to relapse is often very resistant to treatment by orthodox methods. The happiest results, however, attend the treatment of this condition by ionization with salicylate of soda and complete resolution of the furuncles can often be secured by one or two treatments. I have seen furuncles with yellow caps completely disappear within twenty-four hours.

Technique.

I have used the technique described by Norrie in *The Journal of Laryngology* for February, 1927,

with complete satisfaction. The ear outside and inside is first cleaned of all *débris* and grease and a wick of gauze is lightly packed into the canal as far as it will go. Contact with the drum head will do no harm, but the packing should not be done too tightly or pain will result. The auricle is next attended to and all crevices are lightly packed with 2.5 centimetre (one inch) ribbon gauze or 2.5 centimetre bandage. The packing completed, the patient is placed on a table with the affected ear uppermost. The packing is thoroughly saturated with a 2% solution of salicylate of soda. A pad of wool, two layers thick and ten centimetres (four inches) by 7.5 centimetres (three inches), is soaked in the same solution and applied to the skin over the mastoid. The ear having been allowed to fall back into place, a similarly soaked but larger wool pad, two layers thick, is placed over the first pad and the ear, extending over the preauricular skin. On the top of all is placed the usual ionization pad of towel or lint, sixteen layers thick, some ten centimetres (four inches) wide by fifteen centimetres (six inches) long, soaked in the same solution.

The negative terminal and the pads are firmly bandaged to the head. The positive terminal is applied to the arm or leg over a thick pad soaked in saline solution. The current is slowly turned on until five milliamperes are reached, when it is allowed to flow for ten to fifteen minutes. This will accustom the patient to the manipulations and his skin to the current and ionic action, when a dose ranging from ten to thirty milliamperes may be given for about two hours. Patients often fall asleep under the soothing influence of the treatment. At the conclusion of the treatment the current is slowly reduced and all pads are removed. The packing in the canal itself is best left *in situ* for four or five hours, when it may be removed and found to be quite dry.

The only reaction one sees is an erythema such as accompanies all surface ionizations. The patient experiences great relief which increases until all pain and discomfort have gone. Experiments with various other drugs have been carried out, but none gives results comparable with salicylate of soda. Patients are seen twenty-four hours afterwards and the invariable findings are that all pain and discomfort have gone, that the patient has had a good night's sleep and that he is able to eat and talk without pain or discomfort.

Examination of the ear will reveal small elevations in the canal on the sites of the furuncles. These may be probed without causing pain and the ear may be pulled about without the patient wincing.

If there is doubt about the complete resolution of a furuncle or if probing causes pain, the ionization would be repeated, but it is rarely necessary to ionize more than twice, even in the most acute cases. In patients with very fine skins and when a maximum dose has been given, it may be observed in the course of a few days that the skin has become glazed and that a fine branny desquamation is taking place. This, however, leaves no scar or dis-

coloration. The ionization has no deleterious effect on the drum, although immediate examination reveals a varying degree of congestion which soon passes off. To obtain the best results the treatment should be continued for two hours.

The Differential Diagnosis Between Mastoiditis and Furuncle in the Posterior Meatal Wall.

The results of this treatment are so rapid and so uniform that the method deserves a place in the differential diagnosis between mastoiditis and furunculosis. The diagnosis may be a question of the greatest difficulty and only ionization provides us with the answer. No ionization, as at present practised, will remove the œdema due to mastoid disease.

The Middle Ear.

The varying results obtained by aurists who have used zinc ionization for the treatment of suppurative *otitis media* are conflicting. The reported cures obtained by these workers fluctuate between a percentage of 25 and 80. Some have tried it in a few cases and, having been disappointed, have given it up. Others have got good results, and continue this method of treatment. In the London County Council and other aural clinics in Great Britain it has gained acceptance on its merits, but in the special ear hospitals and the special departments of general hospitals it has not yet become a routine method.

It is worth while considering why otologists using this method obtain such conflicting results and I would like to quote first of all Friel's dictum: "To fill the affected sinus completely and keep it full is a *sine qua non* for success with ionization treatment."

The sterilization produced by ionization is a coagulation necrosis of the organisms causing the suppuration. The penetration of the zinc ions, however, is not very deep. It must not be carried too deeply in the middle ear, otherwise necrosis of the mucosa would be produced; hence the current is limited to about three milliamperes. The penetration, however, is much greater and much more effective than that of any antiseptics used as instillations.

Bearing in mind these facts, let us see what results one may expect to get in some typical cases of tympanic sepsis.

In acute *otitis media* with a small perforation the mucosa is thickened and the cavity contains mucus. Suppose we syringe out the external meatus and then fill it with the usual zinc solution and ionize it in the ordinary way. Can we expect anything else but a negative result? In these circumstances the organisms are probably in the mucosa and scattered through the secretions in the middle ear. No one should expect in these circumstances to sterilize the middle ear by ionizing the meatus. A type of chronic suppurative *otitis media* with a small perforation may have a polypus partially blocking the opening. What sort of result are we to expect here from simply washing out the external meatus,

filling it with zinc solution and then ionizing? Assuredly we should expect nothing but failure. It would be quite impossible for zinc ions to penetrate the thickened membrane and then sterilize the whole of the septic contents of the middle ear. The bacteria must be brought within range of the ions. Accessibility is the keynote to success in ionization.

Another type of chronic suppurating ear may have a large perforation with a thin edge of membrane remaining. Syringing of the external meatus may wash out most of the septic material from the middle ear so that the tympanum can be more or less filled with zinc solution. In this instance the cavity is accessible and, even when the preliminary toilet is limited to washing out and filling with ionizing solution, a favourable result is expected.

Again, the perforation in Shrapnell's membrane is usually a tiny track running upwards and giving vent to a thin secretion. No one ought to expect ionization to do the slightest good in such a case. The bacteria are well dug in behind their epithelial trenches and are absolutely out of range of the ions. Unless we get within range, we cannot expect a victory. The difficulty of making the attic accessible is very great, but Friel has recently used a small intra-tympanic electrode when there is a septic confined space difficult to fill with zinc solution. Such a space is the *incus* area. The aim in using this electrode is to make this space open by destroying a certain amount of tissue. The electrode consists of zinc wire to which is soldered some thin copper wire. The wire is fastened to a light wooden handle and in order to limit the action to the part desired, the wire is varnished except at the spot which is placed in contact with the tissue to be destroyed. The current deposits zinc in the tissue and the zinc coagulates and kills the tissue. In a short time the necrosed part vanishes and the space becomes open. Bonain's solution is used as a local anaesthetic. The patient sits in a chair with the indifferent electrode on the arm while the current flows for from ten to twenty minutes at a strength of one to two milliamperes.

Taking all the cases of otorrhœa into consideration, we have at one extreme those in which the area of sepsis is readily accessible and in which no other factor besides sepsis is present to keep up the discharge. These are the cases in which treatment by zinc ionization is so successful. At the other extreme we have those in which the area of sepsis is totally inaccessible. Such are most cases of disease in the mastoid and for these zinc ionization is not successful. Between these two extremes are those in which the patient needs treatment, either to reduce the factors keeping up the discharge to one factor only, namely sepsis or to convert places which are accessible only with difficulty, into places which can be reached. Approximately 50% of all children with chronic otorrhœa may be said to belong to the first category, 20% need an operation in hospital, 30% need minor operations before success is attained.

Before ionization is applied to the middle ear, sepsis in the mouth, nose or throat should be

treated, just as is done as a preliminary to ordinary aural treatment. Next, I would exclude the typical attic conditions and cholesteatomata. It is a waste of time using ionization in them. Coming to ordinary cases in which the tympanic cavity is not obliterated and there is a definite perforation in the tympanum, one asks the question: "Is the tympanic cavity accessible?" A pinhole perforation is not suitable. The perforation must be large enough to admit easily an intratympanic cannula, so that the pus in the middle ear can be washed out and replaced by zinc solution. Even with intratympanic lavage it must be remembered that it is extremely difficult to get rid of all *débris*; but even when a perforation is small, it can be enlarged very effectively with Heath's small membrane punch, made by Mayer and Phelps, of London. I have found this little instrument extremely useful in converting conditions unsuitable for ionization into suitable ones by enlarging the perforation under a local or general anaesthetic to any desired extent.

To improve the chances of success the following toilet should be carried out prior to ionization:

1. Thorough mopping of the external meatus.
2. Suction with Siegle's speculum or a suction bulb and more mopping.
3. Intratympanic irrigation with the zinc solution through the perforation.
4. After draining the ear, instillation or injection of ten minims of 2% cocaine-adrenalin solution. This shrinks the mucosa and opens up pockets.
5. After draining out the cocaine solution, the tympanum is again washed out and filled with zinc solution. The patient's head is inclined to the opposite side, the solution being allowed to flow until half the meatus is filled.

All the bacteria in the middle ear should now be within range. The zinc solution fills most of the middle ear. There are probably some crannies not filled and no doubt some bacteria are lying covered by flakes of epithelium here and there. But if the toilet has been efficiently done the bacteria should be within range. The fluid penetrates into the Eustachian tube in many cases and this is ionized simultaneously with the middle ear.

Zinc ionization is immensely satisfactory if used in suitable cases, that is when the perforation is adequate or when the sepsis is accessible and if due care is taken in the technique.

Jobson describes a hospital which he visited recently in which the staff used ionization for suppurating ears. He was informed that it was done by the nurses under the direction of the medical officer. It was done twice a week for about six weeks! Such a statement alone shows that the treatment was being carried out in an utterly unscientific manner and was simply a waste of time. In suitable cases, using a careful technique, one should get immediate sterilization in nearly all the conditions that are going to get well. That is to say, in the majority of cases one ionization should be sufficient. When granulation tissue is present, it

may require two or three sittings. Repeated ionization is a confession of weakness.

Mastoid operation cavities which continue to discharge, are uncertain problems. The very fact that they have failed to dry up, suggests that some deep bony cavity or infected cell exists. The latter may or may not be accessible. The percentage of cures of the discharge in mastoid operations is about 25. In patients with chronic ear discharge, selected as suitable for treatment, 80% of cures should certainly be obtained. If post-operative mastoid conditions are included, the percentage will be somewhat less. The poor results obtained by some workers are due to: (i) Failure to recognize the sphere of action of the ion, (ii) its use in unsuitable conditions, (iii) neglect of sufficient care in technique. If a commander places guns with a range of ten miles to bombard a fort fifteen miles away and fails to hit the target, he must not find fault with the guns. If the aurist places his battery of ions in the external meatus to bombard the inner wall of the tympanum and fails to slay all the occupants of the wall, he must not place the blame on his ions, he must rather alter his tactics. He must get his guns up into the middle ear where they will be within effective range. Again, when a commander gives battle, he must choose a battleground suitable for his forces. If he attacks mountain fastnesses with ravines and caves where his artillery is ineffective, he cannot hope to expel even a weak enemy. And so the aurist who attempts to ionize a middle ear into which he cannot advance his battery of ions is wasting his time. He is attacking an inaccessible enemy!

From the foregoing remarks it will be seen that electric ionization used for tympanic sepsis, to be effectual, must be applied by a skilled aurist. It is not a suitable form of treatment for the general practitioner or the electro-therapist, much less the nurse.

The primary question of suitability can be decided only by an aurist and the technique is quite outside the scope of anyone but an aurist.

In conclusion I would say with Friel that "ionization is not a panacea," but it is an extremely valuable therapeutic agent for treating successfully many conditions, both in general practice and in our own specialty of oto-rhinology.

Appended is a table to indicate the salt and electrode to be used for introducing the chief therapeutic ions.

TABLE TO INDICATE THE SALT AND ELECTRODE TO BE USED FOR INTRODUCING THE CHIEF THERAPEUTIC IONS.

Ion.	Salt.	Electrode.
Zinc	Zinc sulphate	Positive
Copper	Copper sulphate	Positive
Mercury	Perchloride of mercury	Positive
Quinine	Quinine hydrochloride	Positive
Cocaine	Cocaine hydrochloride	Positive
Chlorine	Common salt	Negative
Iodine	Iodide of potash	Negative
Salicyl	Salicylate of soda	Negative

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THE BLOOD GROUPS OF FULL-BLOOD AUSTRALIAN ABORIGINES.

By GILBERT PHILLIPS, M.Sc. (Sydney),
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By means of a grant made by the Australian National Research Council I have been able to investigate further the reactions which occur when the sera and corpuscles of a number of full blood aborigines are tested by cross-agglutination. In a previous article to this journal I recorded these reactions in the case of ten aborigines on Runnymede Settlement, New South Wales, when three bloods were found to be atypical in that the corpuscles of two of them contained an unidentified agglutinizable substance and the serum of the third contained a specific agglutinin for this substance. In Table I can be seen the results of cross-agglutinating the blood of twenty aborigines at present living on Barambah Settlement, Queensland, by precisely the same methods employed at Runnymede. The following scheme (Table II) shows the distribution of the two agglutinin-agglutinin systems in the four blood groups, the capital letters indicating the agglutinizable substance in each case while the small letters indicate the agglutinins.

Included in Table I are the corpuscles and serum of a Group II "white" blood (Number 21) which were tested against all those of the aborigines. This tabulation represents the reactions which took place on mixing the corpuscular suspensions of the twenty specimens of blood with the serum separated from them. These twenty specimens all behaved typically: twelve of them (Numbers 4, 6, 7, 9, 10, 12, 13, 14, 15, 16, 18 and 20) belonged to Group IV; six (Numbers 1, 2, 3, 8, 11, 19) belonged to Group II; the remaining two (Numbers 5 and 17) belonged to Group III. This distribution is made clear both by the mutual reactions of the aboriginal corpuscles and sera and by this reaction with those of the known Group II blood.

It can be seen that the classification of blood by means of this cross-agglutination method is very tedious and in the case of large numbers is even impracticable. Four hundred tests were necessary to group twenty specimens of blood, nine hundred tests would have been necessary to classify ten more specimens and 5,625 tests would have been

TABLE I.

Corpuscles.	Serum.																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

+ indicates agglutination.
- indicates failure to agglutinate.

TABLE II.

Site.	Group I.	Group II.	Group III.	Group IV.
Corpuscles ..	A + B	A	B	0
Serum ..	0	b	a	a + b

necessary to have classified the seventy-five aborigines which I group by employing Group II and Group III aboriginal sera.

These known sera were prepared from the blood of subjects I (Group II) and 5 (Group III) after fifteen cubic centimetres had been withdrawn from each subject by venipuncture. Subjects 21 to 75 in Table III were grouped by testing their corpuscles against these two known sera.

TABLE III.¹

No.	Name.	Sex.	Age.	Born at.	With Group II Serum.	With Group III Serum.	Subject's Blood
21	Arthur Cobbo ..	M.	43	Gympie ..	-	-	4
22	Joker Bundle ..	M.	45	Springsure ..	-	-	4
23	Tommy Morgan ..	M.	23	Dutchess ..	-	+	2
24	Wonga Pope ..	F.	50	Gayndah ..	-	-	4
25	Mitchell Kilcoy ..	M.	50	Michell ..	+	-	3
26	George Lane ..	M.	50	Fraser Island ..	-	+	2
27	Ned Annan ..	M.	40	Mareeba ..	-	-	4
28	Willie Bone ..	M.	25	Nanango ..	-	-	4
29	Dun Robin ..	M.	40	Clairmont ..	-	-	4
30	Charlie Barney ..	M.	48	Cardwell ..	-	-	4
31	George Bunda ..	M.	40	Gayndah ..	-	+	2
32	Clyde Combo ..	M.	30	Brewarrina ..	-	-	4
33	Bob Hubbard ..	M.	36	Kunna Mulla ..	-	+	2
34	George Shaw ..	M.	40	Cooktown ..	-	-	4
35	Dick Clark ..	M.	40	Bowen River ..	-	+	2
36	Jack Raven ..	M.	50	Port Darwin ..	+	-	3
37	Winnie Barlow ..	F.	31	Barambah ..	-	-	4
38	Emily King ..	F.	21	Springsure ..	-	-	3
39	Mona Malone ..	F.	9	Barambah ..	+	+	2
40	Maggie Tyson ..	F.	10	Winton ..	-	+	2
41	Sarah Sawney ..	F.	20	Mackay ..	-	+	2
42	Darby Croydon ..	M.	60	Croydon ..	-	+	2
43	Fred Loder ..	M.	55	Tenterfield ..	-	+	2
44	Tommy Stuckey ..	M.	40	Cooktown ..	-	+	2
45	Jack Johnson ..	M.	23	Batavia River ..	-	-	4
46	Lucy Stuckey ..	F.	36	Gulf Country ..	-	+	2
47	Cissie Tanner ..	F.	45	Gladstone ..	-	+	4
48	Peter Loder ..	M.	41	Calma ..	-	+	4
49	Henry Gilbert ..	M.	22	Kilkivan ..	+	-	3

+ indicates agglutination.
- indicates failure to agglutinate.

¹ Subjects Numbers 1 to 20 inclusive were grouped by cross agglutination.

TABLE III (Continued).

No.	Name.	Sex.	Age.	Born at.	With Group II Serum.	With Group III Serum.	Subject's Blood
50	Mary Cook ..	F.	30	Chillagoe ..	-	+	2
51	Dolly Britten ..	F.	38	Maytown ..	-	-	4
52	Tommy Britten ..	M.	45	Maytown ..	-	-	4
53	Jinny Annan ..	F.	32	Maytown ..	-	+	2
54	Katie Raven ..	F.	40	Georgetown ..	+	-	3
55	Charlie Mitchell ..	M.	50	Maytown ..	-	-	4
56	Alice Brown ..	F.	35	Burnett River ..	-	+	2
57	Yarrabah Cobbo ..	M.	45	Nanango ..	-	-	4
58	Jack Malone ..	M.	50	Alfa ..	-	-	4
59	Annie Flourbag ..	F.	50	Alfa ..	-	-	4
60	Liza Lane ..	F.	60	St. George ..	-	+	2
61	Boobigen Cobbo ..	M.	65	Burnett River ..	-	+	2
62	Florrie McGowan ..	F.	55	Burnett River ..	-	+	2
63	Lucy McIvor ..	F.	40	Normanton ..	+	-	3
64	Ruby Vanrook ..	F.	45	Cooktown ..	-	-	4
65	Tottie Sandow ..	F.	30	Taroom ..	-	-	4
66	Clorine Bone ..	F.	30	Burnett River ..	-	+	2
67	Watcha Barney ..	M.	28	Burnett River ..	-	+	2
68	Daisy Barney ..	F.	20	Burnett River ..	-	-	4
69	Doris Barney ..	F.	8	Burnett River ..	-	+	2
70	Megwin Buttons ..	F.	45	Gayndah ..	-	-	4
71	Arthur Oscar ..	M.	32	Winton Island ..	-	+	2
72	Jimmie Edwards ..	M.	43	Ipswich ..	-	-	4
73	Billymalone Dalby ..	M.	35	Gympie ..	-	-	4
74	Jack Bradley ..	M.	40	Clairmont ..	-	-	4
75	Ted Duggan ..	M.	50	Bowen Park ..	-	-	4

+ indicates agglutination.
- indicates failure to agglutinate.

Discussion.

In my previous publication I stated that there were four possibilities for the occurrence of agglutinin-agglutinin systems in a primitive pure race, namely:

1. None.
2. Agglutinogens only.
3. One or more systems peculiar to that race alone.
4. The identical systems found in white races.

This work was undertaken to show which of these four possibilities held true. By noting agglutinations and using serum from white persons previous workers had already shown that the blood of aborigines did contain agglutinins and agglutinizable substances, but, without the knowledge that these were identical with the A-a and B-b systems

contained in the whites' sera and corpuscles used for testing, it was not certain that one or both of the following fallacies were being produced:

1. Agglutination between either the agglutinin *a* or *b* and some non-specific agglutinizable substance in the aboriginal corpuscles.

2. Hetero-agglutination between a non-specific agglutinin in the whites' sera and a non-specific agglutinizable substance in the aboriginal corpuscles.

To determine whether these fallacies were or were not taking place it was necessary to cross-agglutinate the sera and corpuscles of a large series of aborigines not only among themselves, but also with the sera and corpuscles of the blood of white people. Their mutual iso-hæm-agglutinations would prove or disprove the existence of one or more specific agglutinin-agglutino-gen systems and their reactions with white sera and corpuscles would then show their similarity with or dissimilarity from the *A-a* and *B-b* systems.

Consider Table I of this paper. The most obvious fact is that there is no instance of auto-hæm-agglutination, that is that none of the specimens of blood contains in the serum an agglutinin which produces agglutination with an agglutinizable substance in the corpuscles of the same blood. Or in other words Landsteiner's law holds true for aboriginal blood, as it does for the blood of white peoples. From this table the presence of two agglutinizable substances and their specific agglutinins can be seen and that they are identical with the *A-a* and *B-b* systems is shown by their reactions with the serum and corpuscles of the known Group II blood. It is therefore justifiable to classify aboriginal blood into one of the four groups of Moss by means of known sera, either white or aboriginal; such a method, however, takes no regard of any agglutinizable substances other than *A* and *B* and can never reveal the agglutinations due to other agglutinin-agglutino-gen systems which undoubtedly occur in the blood of aborigines.

Review of Blood Group Distribution Among Aborigines.

Of the seventy-five aborigines classified (Table III) thirty-nine belonged to Group IV, eight to Group III and twenty-eight to Group II.

No reliable figures have yet been produced for the percentage distribution of the four blood groups

in the Australian aboriginal race owing to the small number of individuals tested in any one series of results. However, 815 full-blood aborigines in all have been grouped by workers in different parts of Australia, including Queensland, New South Wales and South Australia, and when combined these results provide a fairly sound basis on which to calculate the percentage distribution of the four blood groups among the Australian aboriginal nation. I use the word "nation" advisedly since the social organization which was formerly characteristic of the native inhabitants of Australia, leads me to suspect that the blood group unit in these people is the tribe, consisting of some few hundred individuals and that each tribe possessed a characteristic distribution of the blood groups. For this reason I am not surprised to see the vastly different group distribution in widely separated parts of Australia.

In Table IV I have compiled all the group distribution statistics of full blood aborigines which have been published to date.

These figures are not completely adequate, since natives of Western Australia have not been included; however, I shall endeavour to show that it is probably a fairly close approximation of the distribution in the whole nation. The problem which now arises, is the explanation of the conflicting group distributions seen in different States of the Commonwealth. It can be seen for instance from Table IV that of 158 full-blood aborigines in South Australia not one belonged to Group I or to Group III, whereas in Queensland 629 full-bloods contained seven members of Group I and 43 members of Group III.

Consider briefly the social organization and marriage laws of aboriginal tribes some centuries ago. The social unit consisted of the horde comprising some thirty to sixty individuals and passed a nomadic existence over a fairly well defined area on the natural resources of which they depended for their livelihood. The tribe consisted of from ten to thirty or even more hordes each of which spoke the same language and remained in their wanderings within the tribal boundaries. No male was permitted to marry a female member of his own horde, but was legally expected and encouraged to marry a woman who possessed a definite relationship to him. This relationship was of two types,

TABLE IV.

Reference Number.	Name.	Venue and Date.	Method.	Number Tested.	Group IV.	Group III.	Group II.	Group I.
2	Tebbutt and McConnell	New South Wales, 1922	Known White Sera	13	6	0	6	1
3	Tebbutt	Queensland, 1923	Known White Sera	177	99	11	66	1
4	J. Cleland	South Australia, 1926	Known White Sera	101	46	0	55	0
5	D. K. Lee	Queensland, 1926	Known White Sera	377	227	24	120	6
1	Phillips	New South Wales, 1927	Known White Sera	5	5	0	0	0
1	Phillips	New South Wales, 1927	Cross Agglutination	10	4	0	6	0
6	J. B. Cleland ..	South Australia, 1927	Known White Sera	57	30	0	27	0
Present Article	Phillips	Queensland, 1928	Known Aboriginal Sera	75	39	8	28	0
All Authors				815	456	43	308	8
Percentage Distribution of the Blood Groups					56	5.3	37.7	1

ILLUSTRATIONS TO THE ARTICLE BY DR. H. HARRY HARRIS.

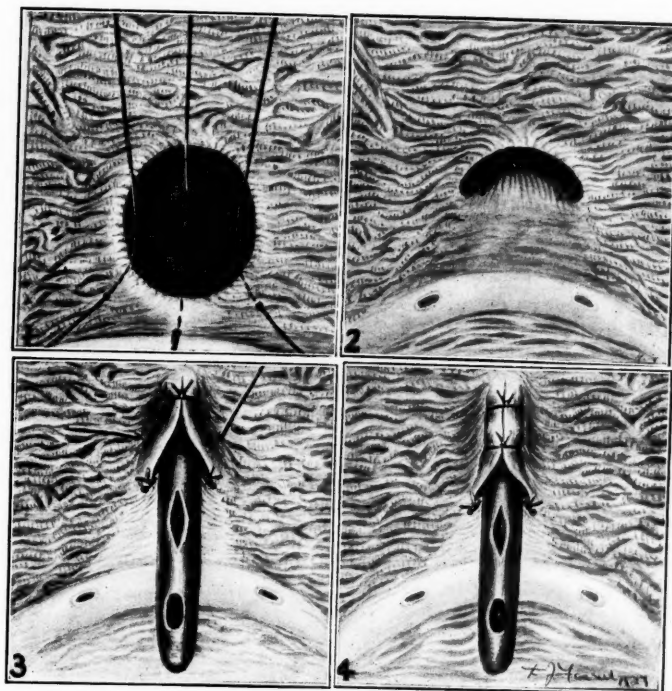


FIGURE I.

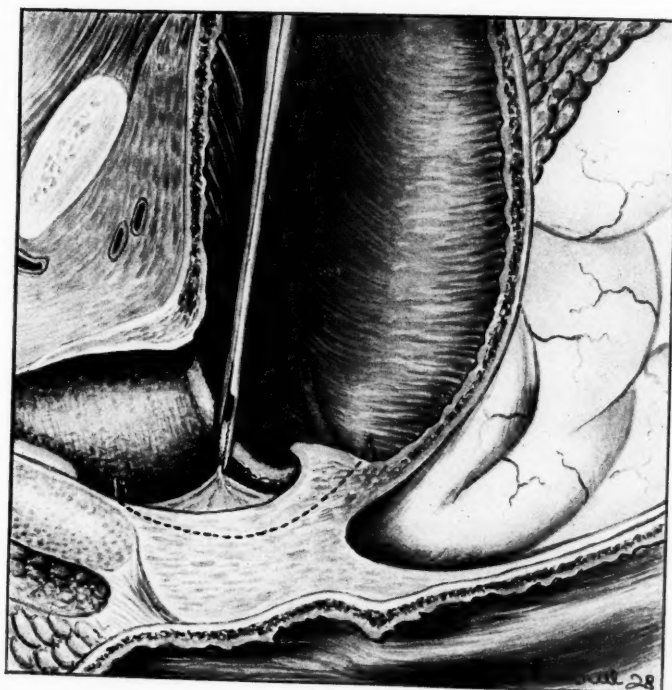


FIGURE II.

ILLUSTRATIONS TO THE ARTICLE BY DR. H. HARRY HARRIS.

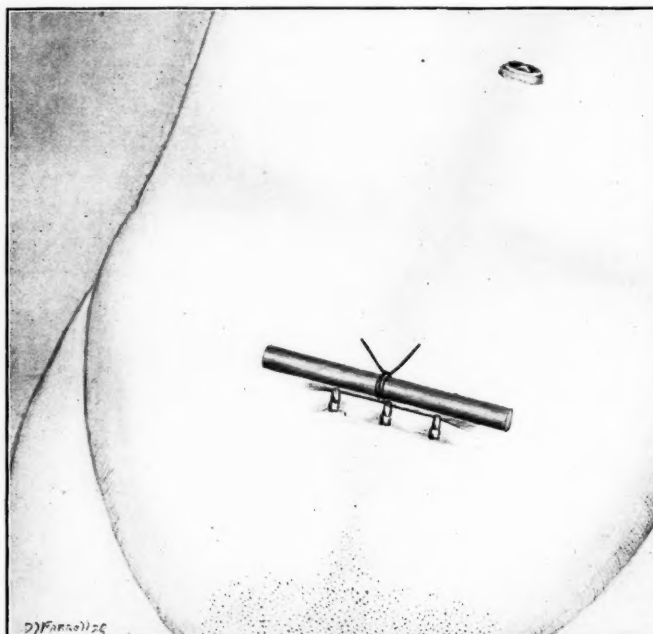


FIGURE III.

ILLUSTRATION TO THE ARTICLE BY DR. RUPERT A. WILLIS.



Skiagram of Spine with Outline of Psoas Abscess on the Right Side.

one of which held true in one great subdivision of the aborigines, while the other marriage relationship was the rule in the other subdivision. My thanks are due to Professor Radcliffe-Brown for the map reproduced here showing the areas over which these two great groups of aborigines are distributed.

In the first group marriage took place for the most part between a man and his mother's brother's daughter, that is with one particular first cousin. He was not allowed to marry any other of his first cousins. In the second group marriage was the rule between second cousins, but only with his mother's mother's brother's daughter's daughter.

Now since an individual's blood group depends on the groups to which his parents belong (this fact has been proved by Hirschfeld, Tebbutt, Snyder, Bernstein and others) it is obvious that these conditions over many hundreds of years would produce a characteristic blood group distribution within each tribe or group of closely related tribes. This being the case, an estimation of the percentage distribution of the blood groups among the whole aboriginal population of Australia can be of very limited value only, for the reason that although the aboriginal race had been isolated from other peoples for many centuries before the advent of

the white man to Australia, nevertheless the race consisted of tribes or closely related groups of tribes each of which possessed a characteristic blood group distribution which differed very greatly in widely separated parts of Australia.

Now consider the geographical distribution of the agglutinogens *A* and *B*. From Table IV it can be seen that of 629 Queensland full-blooded aborigines the blood of 276 contained the agglutininogen *A*, of 28 New South Wales full-blooded aborigines thirteen contained *A* and of 158 South Australian full-blooded aborigines 82 contained *A*. These figures clearly demonstrate that this agglutininogen is equally distributed among the aboriginal population of

these three States which represent large and widely separated areas of Australia.

How different is the distribution of the agglutininogen *B*. In this case the frequency decreases from north to south. Fifty of the 629 Queenslanders contained *B*, only one of the 28 New South Wales natives contained *B* and no single individual of the 158 South Australian full-blooded aborigines tested contained *B* in his corpuscles. It is unfortunate that Tebbutt and Lee made no record of the birthplaces of their subjects, as it is possible that a definite gradient exists in Queensland, *B* being more frequent in the north. Of the 90 aborigines which I

have grouped only eight contained *B* in their corpuscles; of these eight one was a native of the Northern Territory, five were natives of far north Queensland and two had been born in south Queensland. Of these two, however, one was a girl aged nine whose parents were natives of north Queensland.

All these figures indicate that the agglutininogen *B* has been introduced into the originally homogeneous aboriginal race from the north and has not spread to the southern parts of Australia owing to the existence of tribal boundaries and the practice of endogamy by the tribes. It is not improbable that a similar distribution of *B* exists in Western Australia and

Northern Territory and consequently that the percentage distribution of the blood groups among the aboriginal populations of the eastern and western halves of Australia is the same.

Professor Burton Cleland has suggested that the presence of Groups I and III in Queensland full-blooded aborigines is due to recent and slight intermixture with Malays and Papuans; Lee suggested a decreasing frequency of *B* from north to south. There can be no doubt that *B* diminishes in frequency from north Queensland to South Australia and I believe that a similar gradient will be found in Northern Territory and Western Australia, but the fact that *B* has been found more than one



The vertical hatching indicates the habitat of Type I: marriage with mother's brother's daughter.

The horizontal hatching indicates the habitat of Type II: marriage with mother's mother's brother's daughter's daughter.

The dotted area indicates that occupied by either Type I or Type II. It is not yet certain which type occupies this area.

thousand miles from the north coast of Australia argues against recent and slight intermixture and is evidence in favour of the introduction of *B* many hundreds if not thousands of years ago and the prevention of its dissemination by the mode of life and marriage customs of the aborigines. It is to the Northern Territory and Western Australia that we must look for fresh evidence on this problem and the existence of many wild tribes living under natural conditions in these States makes them a rich field for research.

Acknowledgement.

My thanks are due to Mr. G. H. Robin who assisted me in this work and to Professor H. G. Chapman and Professor A. R. Radcliffe-Brown for their very helpful advice.

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THE DIARRHŒAS OF INFANCY.

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THE diarrhœas of infancy are an ever-present source of worry to parents and of anxiety to medical practitioners. Although most cases met with in practice respond readily to simple measures, generally of a more or less routine character, diarrhœa does frequently occur that causes grave anxiety and calls for special treatment. Few practitioners dealing with large numbers of children are satisfied with the results of treatment; nor is that matter for wonder when we realize that with pure food acts, cleaner production and handling of foods, improved housing and better hygienic conditions, although the incidence of "summer diarrhœa" has greatly diminished, the percentage mortality is almost, if not quite, as great as it ever was. It may be of interest to point out that this is the opposite to what is happening in the infectious diseases, diphtheria and scarlet fever; although in these the mor-

tality has lessened, the incidence has increased. It suggests that the reason lies either with the child or with our treatment of the child. When we realize, moreover, that the treatment of diarrhœa has not materially altered in the last thirty years, it behoves us to reconsider the position seriously, to question the accepted ideas of the nature of the diarrhœas and to review the principles and technique of treatment and, even more important, the means we may employ for their prevention.

Causes of Diarrhœa.

Diarrhœa, *per se*, is simply a defensive reaction against a source of irritation and if it were that alone, it would not be a pathological condition but merely a beneficial physiological function. Pathological diarrhœa is, as Flexner pithily puts it, the result of "repeated insults to the intestinal mucosa." In other words, the healthy infant is, by virtue of its prompt reflex responses and its relatively short alimentary canal, enabled to rid itself rapidly of peccant material. But this very fact of active response entails more ready fatigability and greater liability to damage of the intestinal mucosa. Escherich⁽¹⁾ has well pointed out the uncommonly turbulent reactions with rapidly extending inflammation characteristic of infantile pathological change and the absence of "hardening" and of the immunity which the adult has acquired. Hence the primary causes of any form of diarrhœa are such as will lead to damage of the intestinal mucosa and they may be roughly classed as follows:

- (a) Diet: (i) deficiency or excess, (ii) improper balance of food constituents, (iii) spoiled food (sour milk, decayed fruit, bad meat), (iv) indigestible food.
- (b) Atmospheric conditions, as heat.
- (c) Lack of good hygienic conditions.

These causes are those given by almost every writer of the last thirty years. It remains to consider just how they act.

Deficiency of food acts principally by the lowering of the child's resistance to the invasion of micro-organisms; this is not alone a general lack of resistance, the atrophy of the musculature and of the glands and the proliferation of the lymphoid structures of the intestine leading to a local pregnability. McCarrison's experiments⁽²⁾ on monkeys have shown this very clearly.

Excess of food must very rarely be a cause of serious disturbance; it may of course set up a temporary dyspepsia followed perhaps by some diarrhœa, but it is my experience that a baby very soon learns to refuse food when it has had enough. It is often by too frequently waking a baby out of its sleep and forcing food upon it that it gets such an upset. On the other hand, if a baby is constantly underfed, it is more apt to be upset by a sudden excess.

Improper balance, as has been pointed out by McCarrison, is of the same nature as starvation, differing in its effects as to degree of damage and nature of the changes according to the degree and

direction of imbalance of the diet. In a country such as Australia where food is fairly plentiful, yet diarrhoea so rampant, improper balance rather than deficiency must be the more potent cause. Improper balance means essentially a lack of or deficiency in one or more of the vitamins, in mineral salts or in one or other of the amino-acids necessary for growth. These deficiencies exert their influence not only upon the intestines, but also in definite degree upon the endocrine organs with a resulting interference with growth and development. It is in fact impossible to discuss the effects upon one portion of the body without keeping in mind the effects upon the whole body.

Spoilt food, such as sour milk, bad meat, decaying fruit or vegetable, will cause a severe diarrhoea according to the degree of toxicity of the food, but, while the actual attack may be severe, the child will readily shake it off if the previous dietary has been satisfactory. The same remarks apply to indigestible food.

When we consider atmospheric conditions, there is no gainsaying the profound influence they exert upon the incidence and severity of diarrhoea. It may, I think, be accepted that there are two chief factors in this influence, the lowered powers of digestion of infants in hot weather and the effect of heat on the growth and multiplication of bacteria. Similarly bad hygienic conditions, dirt, lack of fresh air and of sunshine, act by lowering the child's resistance and by encouraging the growth of pathogenic organisms.

The presence of parasites in the intestine must always be kept in mind, especially when dealing with recurrent attacks of diarrhoea.

This brings us, finally, to the one essential causative factor in all diarrhoeas, the presence and activity of pathogenic microorganisms. Jackson in 1812 attributed "the chemical changes which take place in the contents of the stomach and bowels of children dying of diarrhoea to the putrefaction of animal food and the acetous fermentation of that which is vegetable." The numerous workers in bacteriology have focused attention upon the organisms found in the intestinal contents; most if not all organisms to which diarrhoea is ascribed, are often found in the intestine of normal infants. To what can we ascribe their pathogenic activity? It has been proved beyond doubt that the diet of an infant greatly influences, if it does not determine, the character of the intestinal flora. Flexner, in America, and Webster, in Melbourne, have demonstrated the frequency with which the dysentery bacillus is found in the stools of infants suffering from "summer diarrhoea." This seems to be more of the infectious disease type, akin to the typhoid and paratyphoid infections. Nevertheless it cannot be too often or too vehemently emphasized that the diet and the state of the child are of far more importance than the nature of the causative bacilli. I emphasized this aspect in a paper published in 1913⁽³⁾ and Nabarro,⁽⁴⁾ working at Great Ormond Street in 1923, found little support for the theory of milk-borne infection and gave first place to the

diminished resistance of the child. McCarrison,⁽²⁾ also, from Indian experiences, confirms these views.

Prevention of Diarrhoeal Diseases.

Our attention must first be directed to the hygienic conditions under which the child is living; absolute cleanliness must be our first objective, cleanliness of body, clothing, bedding and all feeding utensils. The universal "comforter" must of necessity introduce many organisms at least into the mouths of the babes and may very possibly be a source of the streptococcal infections in infancy. Clothing should be light and only sufficient to keep the child comfortably warm; most infants are much too heavily clothed. Fresh pure air and sunshine are essential.

An abundance of fresh food is a prime necessity. There is no doubt that human milk is the ideal food for an infant, but dangers lurk in a too great insistence upon breast feeding. It should certainly not be continued beyond nine or ten months of age and I would join issue with those who consider mere gain of weight a sufficient reason for its continuance. Although breast-fed babies do not often get the more severe types of diarrhoea, badly breast-fed babies are especially predisposed to disturbances at the time of weaning. Professor Louise McIlroy⁽⁵⁾ gives the following figures: seven hundred and thirty infants were traced for nine to twelve months after birth, three hundred and thirty-three were entirely breast fed, among them were sixteen deaths; three hundred and twenty received artificial food at varying intervals after leaving the hospital, among them there were no deaths; but among thirty-seven who were never breast fed, there were three deaths.

Space will not permit a discussion of substitute foods; suffice it to say that pædiatricians all the world over are convinced that cow's milk is by far the best substitute, if available. I have never yet met with a baby that could not be induced to thrive on cow's milk, properly modified. Where fresh cow's milk is not available, dried milk ("Glaxo" or "Lactogen") can generally be obtained. On no account should condensed milk be used as a routine food for an infant; containing as it does 55% of sugar and a grave deficiency of fat and protein, it creates just the conditions that render a child liable to diarrhoeal diseases. Similar objections may be taken to all the patent or proprietary foods containing cereals, whether the starch be completely or incompletely converted; useful as they may be for tiding a child over an emergency, they should never be used for any length of time.

Investigation of diarrhoeal diseases during one summer showed that two-thirds of the babies coming for treatment had been fed on condensed milk, although condensed milk was not in such general use at the time as fresh milk or the dried milks. But if a baby is fed on any artificial food, I insist that a more mixed and balanced diet should be commenced at seven or eight months of age. I aim at getting a baby on to a full mixed diet by the age of twelve months and I can confidently assert, as I have done before, that no infant so fed will

get an attack of the infantile type of diarrhoea during its second year of life and that therefore the mortality from gastro-enteritis during the second year can be entirely eliminated. The question arises as to the Pasteurization or boiling of milk; from the careful observation of large numbers of babies so fed I am quite positive that they do not make such good progress and certainly are not so resistant to disease as those fed on untreated milk. Escherich was, I think, the first to advance the argument against partial sterilization that it destroyed the harmless saprophytic organisms and allowed the more harmful proteolytic and anaerobic organisms to multiply unhindered. Jones and Little⁽⁶⁾ have shown that fresh raw cow's milk has the power to inhibit the growth of streptococci and that this power is destroyed by boiling or Pasteurizing.

Treatment of Diarrhoea.

The principles of treatment adopted, with but slight modifications, during the last thirty years may be briefly stated as follows: initial purgation followed by abstinence from food for six, twelve or twenty-four hours, then gradual return to food of some kind. Abt has repeatedly protested against the initial purgative; nevertheless we must admit that the dose of castor oil, generally given by the mother at the onset, has often seemed to check the diarrhoea. I do, however, protest against its repetition and emphatically endorse Abt's protest against the use of magnesium or sodium sulphate in the so-called dysentery of children. Calomel, given in repeated doses of 0.005, 0.075, 0.01 gramme (one-twelfth, one-eighth or one-sixth of a grain) at half hourly or hourly intervals up to 0.06 gramme (one grain) has the advantage of checking any tendency to vomiting and thus facilitating the administration of copious amounts of fluid by the mouth during the period of abstinence from food.

Abstinence from food, particularly from the article of diet upon which the child was fed at the time of the upset, is essential to successful treatment. All food should be stopped immediately, plenty of water being given in its place. The abstinence, however, should not be too long continued, a return to some form of nourishment being made as soon as possible. While all writers on the subject have urged the administration of large amounts of fluid by the mouth, subcutaneously or intraperitoneally, it was Marriott⁽⁷⁾ who emphasized the distinction between what he calls "anhydræmia," the state of dehydration following severe diarrhoea and necessitating the administration of fluids, and "athrepsia" or marasmus due to lack of nourishment. He urged the early return to food, but pointed out that it was often impossible for an infant to assimilate the food until the fluid balance was restored in the tissues. Hence it is often of value to give instead of water a more colloidal fluid such as a 5% solution of glucose, the absorption of which is slower, but which is more readily retained by the tissues.

As to the diet with which we may resume feeding, opinions are not so unanimous. The customary

routine seems to be to adopt a high carbohydrate diet to the exclusion of fats and the limitation of proteins irrespective of the cause and nature of the diarrhoea. Morse and Talbot,⁽⁸⁾ on the other hand, recommend a fixed rule; if the diarrhoea is due to the dysentery or allied organisms, they give an almost exclusive carbohydrate diet, whereas if due to the gas bacilli, they give lactic acid mixtures in the form of unheated buttermilk or mixtures containing no fat, 3% of lactose and from 1.5% to 2.5% of protein, ripened with lactic acid-forming organisms; they recommend lactose rather than the dextri-maltose preparations as the preliminary carbohydrate. Whatever may have been given at first, the child must as soon as possible be placed on a diet upon which it can obtain sufficient nourishment to gain weight and thrive. While I endeavour always to get the child on to fresh cow's milk, at first well diluted, it is sometimes necessary to return temporarily to the food upon which the child was fed prior to the upset. The widely prevailing idea that athreptic infants are unable to deal with fats, has been proved to be untrue; in the absence of diarrhoea they can assimilate fats almost as well as normal infants.

The principles of treatment are thus fairly clearly established. I think it is rather in their application that we are apt to fail. In the first place instead of boldly stopping all food we are apt to temporize, allowing a little food that just keeps the diarrhoea going or rushing back to food too soon. A second fault, met with rather in private homes than in hospital wards, is the failure to give sufficient fluid during the starvation period. The third fault and perhaps the most serious, is the failure to realize that, having cured the anhydræmia, we are producing the condition of athrepsia by the too long withholding of suitably nourishing food.

The chief causes of the high mortality are three in number. First there is the failure to feed infants so that they are able to withstand an infection; the observation of the two groups side by side shows that infants fed on fresh raw cow's milk have a distinct advantage over those fed on proprietary foods or dried milks as regards loss of weight, duration of illness and ease of return to a weight-gaining diet. The second cause is the failure to seek skilled treatment sufficiently early. The third cause is in a few cases a failure in the technique of treatment. So long as the weight chart remains the criterion of the suitability of a diet, so long will the first cause which I consider the most potent of all, remain operative.

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PSYCHO-ANALYSIS AND THE WORSHIP OF BAAL.

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UPON the dauntless head of Sigmund Freud, a man as full of wisdom as of years, whose nearest neighbour now is death, has fallen the manifold oburgations of the many. But those who decry psycho-analysis, seem in many respects like the ancient Hebrew prophets who, when the children of Israel made molten images and worshipped in the house of Baal, the phallic god, rent their garments and put ashes on their heads and sought out the idolaters with swords. Their cries were loud in the land and their zeal was hardly abated. And so it is with the modern traducers of Freud. For the Jewish doctor appears to have taken the place of the older deity and certain idolatrous physicians have become learned in his ways, substituting the consulting room for the "grove" and using the ritual of "free association." Their symbols are the symbols of sex. The *libido* is their lord. So our modern Elijahs and Jehus gird up their loins and light the torches of their indignation with fiery words and call down the ridicule and the wrath of outraged righteousness upon all who bow before Baal-Freud.

The fierce antagonism with which the majority of Freudian ideas has been assailed by orthodox opinion and conventional medical thought, and the arguments which still arise at the mention of psycho-analysis, give some idea at least of the importance of Freud's basic concepts. Intolerant opposition has at all times in the past attended the birth of a new doctrine. The path of the pioneer is paved with thorns. Resentment has ever been the exhibit of lesser men. Roger Bacon was imprisoned and Galileo tried and incarcerated by the Inquisition. Darwin was derided and Lister made to suffer the contumely of his medical contemporaries; for leaders in every department of life have been targets for the rotten eggs of their smaller minded and infuriated fellows. Had Freud eschewed all sexual issues and enunciated some new Christian mysticism, he would surely have been canonized and raised to share with Mary Baker Eddy the lofty pinnacle of her notoriety. He chose, however, to evolve a system of psycho-analysis with emphasis on infantile sexuality and incest and has therefore been forced to see his work ridiculed and condemned and his followers have been stigmatized by the

bigoted believers in older doctrines as "lovers of prurience and dabblers in impropriety."

Psycho-analysis is now, as it were, both on the index and on the town, to be cajoled by all comers and seduced accordingly. It functions equally as a taboo and a topic. As a mode of investigation it is in some quarters regarded as a taboo because it seeks to reveal aspects of man's oldest repressions; and it is on the town in that a number of its tenets have been seized upon by the younger intelligentsia and woven into novels and plays in a desire to achieve that smack of modernity after which an up-to-date public seems to hanker. It has sunk even lower than the circulating library, for the commercially unscrupulous have added it to the list of remunerative quackeries and profess to teach its secrets by a correspondence course.

Half a century ago learned argument centred on the soul; now it turns upon the *libido*. The clergy have enlarged their vocabularies and "repression" has become a tea-table chit-chat. Freud has become the psychologic storm-centre in modern thought and while goggle-eyed psychologists are probing the recesses of the subconscious or disentangling the symbolism of dreams, flappers are flirting with a suggestive terminology and serious-minded old maids (in America, at any rate) are attending popular lectures on "sublimation." The astute editor of *The Journal of the American Medical Association*, Dr. Morris Fishbein, has included psycho-analysis in his latest volume of "Medical Follies" along with the Casanovarian cult of Astral Healing, Irido-Diagnosis and Chiropractic. To some it would appear that this Freudian fruit hangs upon the forbidden tree in which hides the beguiling serpent of sex, while others have eaten of its exotic growth as though from the Tree of Knowledge itself. For, like a coin, it possesses two sides, the one signifying a revelation, the other merely analogous to a Voodoo cult.

Psycho-analysis is primarily a technique for the investigation of the human mind. It is the key to the boudoir of the subconscious, unlocking the door on desires which had ever been secret and on motives which have lain hidden in the inmost closets of the mind, the discovery of which are necessary for the further development of the individual. It is thus the basis of a new philosophy and already has transformed the moribund body of academic psychology into a fresh and living organism. As Ferenczi puts it: "Psychiatry, which was formerly a museum of abnormalities before which we stood in uncomprehending amazement, has become through Freud's discoveries a fertile field of scientific research, susceptible of coherent comprehension." It is secondarily a form of therapy. Mental illness has always been regarded with a certain awe, something over which the magicians and the priests have had more power than the ordinary practising physicians; this being so, therapeutic analysis is regarded in the light of a cult and must at any rate for a long time to come remain alien to the general practitioner and in the hands of those whose work is exclusively psychiatric.

Psycho-analysis has reorientated our knowledge of psychiatry. Those who work among the mentally afflicted, realize its value and will agree with Stoddart, Hamblin Smith and Professor George M. Robertson that seldom a day passes in the examination of insane patients but that they fall back on the nomenclature and the theories enunciated by Freud and his collaborators in the interpretation of their cases. Their experience has taught them, despite the jejune jibes which come from those to whom psycho-analysis is anathema, that some neuroses can be cured, the milder psychoses averted and the conduct and behaviour of insane patients explained only on the basis of the unconscious and in a manner to which Freud originally pointed the way.

That psycho-analysis is damaging to man's self-esteem is perhaps the chief cause of the opposition with which it has been met in the minds of its assailants. Men are quite willing to believe that a maniac has a "basic inferiority complex," but are naturally intolerant of the doctrine which proclaims to the world some aspects of their own behaviour as a manifestation of the same inferiority. They may accept the statement that paranoia is based upon homosexuality, but become enraged when invited to believe that some of their own activities are but sublimations of the same tendency. What they know to be true of the eunuch they repudiate as a "castration complex" in themselves; they have striven so mightily to stifle their incestuous wishes that the mere reminder of their presence in the subconscious serves to infuriate them.

Truth has never been acceptable in its nakedness. Darwin's doctrine had a similar effect on their grandfathers who had long deluded themselves about their divine descent. From being "a little lower than the angels" it brought them a little closer to the apes. And now Freud has added further to mankind's general discomfort by sticking the pins of psycho-analysis into our cherished little bladders of personal vanity. *Hinc illæ lacrimæ!*

It will not be asserted that all Freud's doctrines are true. But the Ark of the Freudian Covenant—the Oedipus complex—has supplied a key to the riddle of human personality. For, as Otto Rank has said: "The relation of the child to the father and mother determines in conclusive ways the love-life of the human being, as well as his social behaviour." Much indeed of Freud's symbolism is open to question and many of his conclusions with the passing of time and the addition of knowledge may need amendment. But his penetrating views on the all important questions of belief and behaviour have given us an insight into herd history and sociology the value of which is scarcely yet realized.

What dissecting is to anatomy, psycho-analysis is to psychiatry. But each year the domains of psychiatry tend to broaden, linking up with those of social hygiene and education and sociology. It is, therefore, to all these aspects of human endeavour that psycho-analysis supplies a conceptual background and gives an impetus to investigation. This theme was recently developed by Dr.

William A. White in his presidential address to the members of the American Psychoanalytic Association in 1927, where he stated that:

It has become increasingly evident not only, as I am fond of saying, that the psyche like the soma has its anatomy, its physiology, its embryology, its comparative anatomy and its paleontology, but that the individual human mind can no longer be understood in all the fullness of its reactions as standing alone, but that it must be understood as a unit in the scheme of the larger unit of society and that in fact an understanding of the cellular and organic structure of the body is fundamental to an understanding of the body as a whole.

So despite the rhetorical rage which it has evoked, and the verbal vitriol which has been hurled as its instigator, psycho-analysis refuses to be chased off the stage and will no doubt be still prominent on the proscenium of science when its loudest detractors have put off their motley for ever.

Myth, magic and make-believe have contributed in no small measure to the ornamental pattern of racial history and the idiosyncrasies and psychic maladjustments of mankind continue to frustrate our ideals. Mental inertia and bigotry, legacies from the troglodyte dog the footsteps of progress. But though Freud's followers be still regarded as the priests of Baal, the cat-calls of callow-minded clerics and all the shouts of tin-horn psychologists will not succeed in demolishing that which is primarily a technique for the investigation of the human mind, and with it that immense study in psycho-pathology which they so proudly call civilization.

Reports of Cases.

A CASE OF TYPHUS-LIKE FEVER.

By W. J. PENFOLD, M.B., B.Hy.,

AND

A. B. CORKILL, M.B., B.S.

[From the Baker Medical Research Institute.]

Clinical History.

THE patient, a male, aged thirty-eight years, was admitted to the Alfred Hospital on April 13, 1928, complaining of feverishness, headache, general malaise and pains in the left chest.

Past History.

The patient suffered from yellow fever twenty-four years ago in Chili and from trench fever at the war. He was inoculated in Egypt in 1916 with typhoid-paratyphoid A and B ("T.A.B.") vaccine. He had also six other miscellaneous vaccinations during the war.

Present Illness.

The present illness commenced four days ago with sudden collapse, feverishness, delirium, headache and pain in the left side of the chest. These symptoms continued and increased in severity up to the date of the patient's admission to the Alfred Hospital. No epistaxis or cough occurred. There had been no abdominal pain.

Physical Condition.

An examination of the heart revealed nothing abnormal. At the base of the left lung there were prolongation of expiration and diminished resonance. Examination of the abdomen and central nervous system revealed nothing abnormal. The temperature was 39.4° C. (103° F.), the pulse 108 and the respirations 24 per minute. There was no rash of any description visible. The condition was provisionally diagnosed as an enteric infection and blood

for a Widal test was sent to the laboratory. A blood culture was also taken to be examined for enteric organisms.

On April 14, 1928, the patient looked very "toxic" and dehydrated. He complained of severe generalized headache. The temperature was still 39.4° C. and the respirations 24. The resident medical officer, regarding the condition as an enteric infection, gave fifty million *Bacillus coli communis* Escherich intravenously. Neither the blood culture nor the Widal test had yielded positive results.

On April 15, 1928, the patient had a slight rigor, but the temperature did not return to normal. The blood culture of April 13 was still apparently sterile.

On April 16, 1928, one hundred million *Bacillus coli communis* Escherich were given intravenously. The patient had a severe rigor and the temperature rose to 40.8° C. (105.6° F.).

On April 17, 1928, as the temperature was still over 37.8° C. (100° F.), one hundred million organisms of the same vaccine were given intravenously. The patient had an intense rigor and the temperature rose to over 40.5° C. (105° F.). At this stage the Widal test gave a slight agglutination (P ±) in a dilution of the patient's serum of one in eighty. We reported that this reaction was probably due to the fact that the intravenous shock therapy, in stirring up the general immunity reactions, had caused some slight revival of the patient's old immunity to typhoid received during the war.

On April 19, 1928, the temperature was normal and the patient felt quite well.

On April 21, 1928, the patient was still doing well. The Widal test still yielded no reaction. At this stage a friendly criticism was made by the resident medical officer concerning the laboratory's constant failure to find a reaction in a case of "typhoid fever." The laboratory had noted the negative findings, but as we had recently had several enteric fever patients yielding no Widal reactions until late in the second week of the disease, we had not regarded these negative findings very seriously. However, following this criticism, we inspected the patient and as the result of our examination we suggested that the patient's serum be agglutinated against the *Proteus* strains × 19 and Kingsbury strains. The result of the agglutination test is shown in the accompanying table.

In view of these findings we regarded the condition as being one of a typhus-like fever. Subsequent examinations of the faeces and urine failed to reveal any pathogenic organisms.

Discussion.

It is instructive to study the typhus charts that are shown below. Chart Number 1 shows a typical tempera-

Organism.	Patient's Serum in Dilutions of				
	1 in 40.	1 in 80.	1 in 160.	1 in 320.	1 in 640.
Typhoid bacilli	++	—	—	—	—
Para A bacilli	—	—	—	—	—
Para B bacilli	—	—	—	—	—
X 19	+++	+++	+++	+++	+
Kingsbury	+++	+++	+++	+++	+

ture chart in typhus fever. Chart Number 2 is the temperature chart of the patient seen in the Alfred Hospital. Chart Number 3 is an atypical chart from a patient with mild typhus fever.

It will be seen that the chart of our patient closely resembles in its fall by crisis the temperature chart of the atypical form. These charts are taken from charts in "Lehrbuch der Infektionskrankheiten" by Jockmann-Hegler, pages 788-796. In this volume a comprehensive description is given of the various clinical types of typhus fever. Mild atypical cases are described occurring with slight cerebral symptoms, fever and headache. In many of these cases the whole course of the disease lasts only for five to six days.

The occurrence of a typhus-like fever in a patient at the Alfred Hospital, Melbourne, has again brought to mind the possibility of endemic typhus in Australia. Since Hone in 1921-1922⁽¹⁾ and Wheatland in 1926⁽²⁾ reported their series of cases, this contingency has been constantly watched for. Apart from cases of typhus that have occurred in ships arriving from foreign ports, there has been no evidence since 1860 of endemic typhus fever in Australia.⁽³⁾ The recent Australian cases have in symptomatology and Weil-Felix reaction borne some resemblance to mild typhus fever.

However, as Wheatland points out, the absence of lice and the insusceptibility of guinea pigs are distinctly against the diagnosis of typhus fever. The possibilities concerning the Australian cases are:

1. They are mild cases of true typhus fever.
2. They are cases of a disease merely resembling typhus fever. Considerable animal experimental work and particularly cross immunity reactions are necessary before we can come to any definite conclusion. In Hone's series of cases only one guinea pig was inoculated and no temperature chart is shown in his communications. Wheatland inoculated guinea pigs (the number is not stated) with blood from patients, but observed no fever.

We would suggest that in any case where the symptomatology indicates enteric fever, but where persistent absence

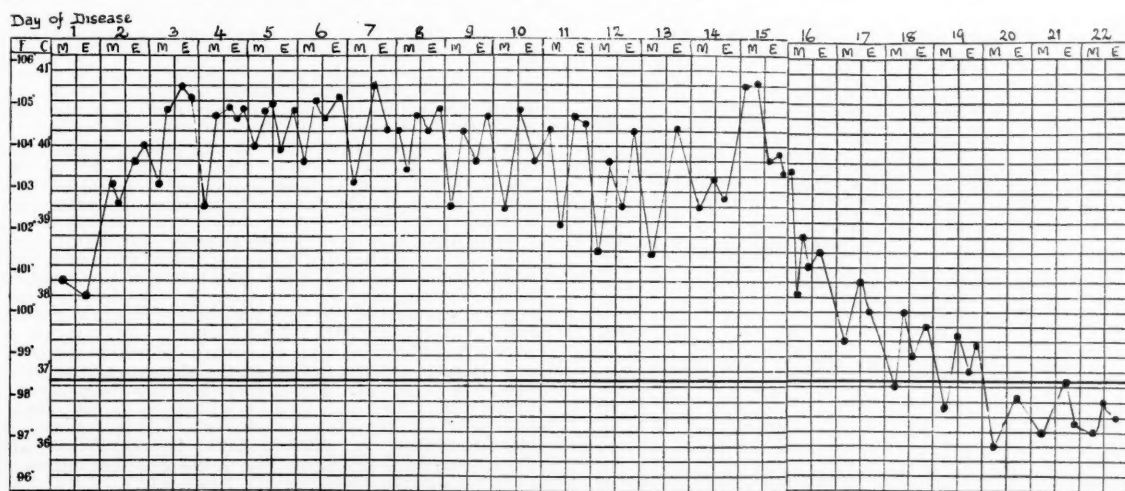


CHART No. 1. Typical Temperature Chart in Typhus Fever.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 8, 1928.

Poliomyelitis.

ON March 13 and 14, 1928, demonstrations were given by competent practitioners on the several aspects of the control of poliomyelitis or Heine-Medin disease. The demonstrations were arranged by the Melbourne Permanent Committee for Post-Graduate Work and all medical practitioners desirous of attending were invited. No fee was charged. The wisdom of this action is apparent. A great deal of information concerning the disease has been gathered during the past few years. Much of the old teaching has been abandoned and new doctrines have been substituted for the discarded hypotheses. It would seem that the affection is becoming commoner and the question of its epidemic character has now to be taken into consideration. The prognosis is assuming a different aspect. The time is therefore ripe for an attempt to gain the collaboration of the general practitioner, the pathologist, the hygienist, the immunologist and the epidemiologist. To further the objective of the Melbourne Permanent Committee steps were taken to present in a readable form the subject matter of the demonstrations. The sanction of the Committee was generously afforded to this journal and the result is a symposium which should be of great value to the medical profession throughout Australia.

When those who are now senior practitioners, were students, the disease was usually spoken of as infantile paralysis. It is true that the name met with disapproval long ago, not only because it affects adults from time to time, but chiefly because infants are liable to suffer from other forms of paralysis. A quarter of a century ago this disease was not discussed in books on infections. Twenty years ago the probability of a microbial cause was considered and the acute stage of the disease was recognized. The same difficulty exists today as existed then; the acute stage is often so indefinite, of such short duration and so varied in its manifestations that it

is overlooked. The work of Flexner and of Levaditi on the causative virus confirmed the suspicions of the older pathologists and led to the general acceptance of the modern doctrine of the ætiology of acute poliomyelitis.

In the older descriptions, as the term anterior poliomyelitis implies, the lesions were supposed to be localized in the grey matter of the anterior cornua of the spinal cord. It will be noted that Dr. Reginald Webster demonstrated that the interstitial inflammation and the changes in the ganglia cells are not limited to the anterior horns, but have been found in the posterior horns, in the white matter and also in the meninges. It thus appears that the original conception of the disease, as an inflammatory affection of a limited area of the spinal cord, has been relinquished. There is some indication that poliomyelitis, polio-encephalitis, acute encephalitis and perhaps some other infective processes involving nervous tissue are closely related. Histological studies are not likely to reveal the true nature of these infective processes. Advance is coming from another line of investigation. At present the attention of the profession is being directed to the immunological phenomena of the disease. As is usual in connexion with disease the cart is placed before the horse. Instead of following the trail of ætiology and pathogenesis the workers have sought to attack the problem of treatment. The excuse of urgency must be admitted, but it is obvious that a structure built on the insecure foundation of a half discovered set of biological facts may be unstable.

The prophylaxis of poliomyelitis is of far greater importance than the treatment of the developed disease. Unfortunately the knowledge accumulated up to the present time is insufficient to enable the hygienist to devise a plan of prevention. The early treatment by the injection of the serum of convalescents from the disease acts to some extent as a prophylactic measure, since, if successful, it prevents the appearance of the paralytic signs. It does not go far enough. It fails to influence the source of infection except by reducing the time during which the patients are actually harbouring the virus in an active condition. This form of treatment must be applied as often as possible. The immune

serum should be injected as soon as the diagnosis becomes reasonably probable. The work conducted by Dr. Jean Macnamara and Dr. F. Morgan in this connexion is deserving of recognition and is admirable. The defect attaching to this form of treatment, however, is an almost insuperable one. The amount of serum that can be collected, cannot suffice for the needs of the whole community while the disease is sporadic or scattered. If it became epidemic in any centre or district, the supply would be quite inadequate to meet the demand.

It will thus be seen that much work remains to be done. This work must be carried out in the laboratory, in the clinic and in the patients' homes. The pathologist, the immunologist and the clinician need to think hard and to employ all the ingenuity at their command. Careful observation and accurate record are the starting points of investigations of the kind necessary for the elucidation of the problems. General practitioners are invited to contribute to this research by publishing in these columns as many facts as they can assemble. Some points of importance are the relative value of the serum of persons who have suffered from the disease within a short time of its use, and of the serum of persons whose attacks lie far back in the past; the association of acute poliomyelitis and other infective processes in one family and in one community; the antecedent history of every patient, more particularly in regard to illnesses that might reduce the power to resist infection by the poliomyelitis virus. Other points of interest will occur to the clinician and general practitioner when the patients are watched. A spirit of inquiry is needed and some imagination, but the observer should guard himself against preconceived ideas and hasty conclusions on occasional occurrences.

Current Comment.

TUMOUR OF THE PANCREAS AND HYPOGLYCÆMIA.

Two main types of carcinoma are described as occurring in the pancreas—cylindrical celled adenocarcinoma arising from the ducts and carcinoma arising from the parenchyma. Carcinoma of the ducts is composed of papillary outgrowths and alveoli lined by cylindrical or cuboidal cells. In carcinoma of the parenchyma the cells are small

or large, granular, hydropic or fatty and resemble those of the pancreatic alveoli. Ewing has stated that there may be a collateral or preexisting hyperplasia of the gland tissue which is difficult to distinguish from invading carcinoma. The islands of Langerhans are usually hypertrophied and may be considerably increased in number and there may be many transitions from secreting to island tissue. The islands may exhibit a peculiar hypertrophy approaching the structure of the tumour. Ewing thinks that it was this appearance which led Fobozzi to conclude that all parenchymatous cancers arise from the islands. He also states that another feature which might suggest such an origin, consists in focal adeno-carcinomatous areas which somewhat resemble hypertrophic islands. In June, 1927, Wilder, Allan, Power and Robertson described a cancer which they showed conclusively originated in the islands of Langerhans. The clinical history of the patient was of unusual interest. He was a medical practitioner, aged forty years. After he had been subjected to gastro-enterostomy and appendectomy for an alleged peptic ulcer, he suffered from attacks of faintness with sweating and became stuporose. It was found that his blood sugar level reached as low as 0.0275 gramme per hundred cubic centimetres. It became normal when he was given fifteen grammes of dextrose. The liver functioned normally as far as the deaminization of amino acids was concerned and bile and injected dyes were excreted in a normal manner. Normally epinephrine mobilizes glycogen and if glycogen stores are present in the liver, hyperglycæmia is produced. It was found that epinephrine produced no interruption or delay in the fall of blood sugar. Pituitrin likewise had no effect in delaying the symptoms of hypoglycæmia. An exploratory operation was performed by W. J. Mayo and the pancreas was found to be large, hard and nodular. A tumour was felt in the liver. A piece of liver was excised; its glycogen content was found to be 3.49%. During post-operative treatment a continuous intravenous injection of a 20% dextrose solution was given. When oral feeding was resumed, more sugar than before was needed and the final requirement was one thousand grammes a day. The patient died from exhaustion and no hypoglycæmia was present at the time of death. At *post mortem* examination "carcinoma of the pancreas" was found and carcinomatous deposits were discovered in the liver and lymphatic glands. The cells of the tumour bore a striking resemblance to the cells of the islands of Langerhans. The liver weighed 3,300 grammes and contained 8.25% of glycogen. An alcoholic extract was made from the cancer tissue in the liver and this extract when injected into rabbits acted in a manner similar to "Insulin."

William Thalheimer and F. D. Murphy have recently reported a case of a similar nature.¹ The patient, a woman, aged fifty-seven years, after about two and a half years of suffering from symptoms which gradually increased in severity, passed into

¹ The Journal of the American Medical Association, July 14, 1928.

a state of almost constant semi-stupor, accompanied by frequent convulsions and hypoglycemia. The patient died in coma. The significance of the spontaneous hypoglycemia was not recognized during the patient's life time and the clinical study was therefore incomplete. At *post mortem* examination a small tumour of the pancreas was found. Its bisected surface measured one by one and a half centimetres. There were no metastases. The authors conclude that the tumour cells caused a hyperinsulinism which led to hypoglycemia and death.

Several interesting questions arise in connexion with these reports. That of Thalhimer and Murphy is incomplete as compared with that of Wilder and his collaborators. At the same time its incompleteness gives it a certain added interest. The condition of the first patient was recognized at a comparatively early stage and he was kept alive by the constant administration of sugar. Had this been done with the second patient, it is possible that she might have lived long enough for metastatic deposits to occur in her liver and in the lymphatic glands. On the other hand the absence of metastases may have a definite significance.

There arises the question of the description of this tumour as carcinoma of the islands of Langerhans. It would be unusual for the cells of one part of an organ to take on malignant action without cells so closely associated as those of the alveoli are in the pancreas to the islet cells, taking any part in the process. It is true that in the liver, for example, malignant disease may arise in the bile ducts, but there also occurs a primary carcinoma of that organ. The association of bile ducts to liver cells is what may be called a mechanical association of continuity. The association of alveolar cells of the pancreas with islet cells is a physiological one. Ewing's view on parenchymatous malignant tissues of the pancreas have already been mentioned and the reference to the contention of Fobozzi at this juncture is important. A great deal will depend on how far the proliferation of the cells of a structure may be regarded as hyperplasia and when the growth may be said to become malignant. It may be useful to compare the tumours under discussion with those of the thyroid gland. One school of morbid anatomists regards a certain form of swelling of the thyroid gland as a hyperplasia, another regards it as an adenoma. The tumour described by Thalhimer and Murphy may be compared to a tumour of the thyroid accompanied by hyperthyroidism and that described by Wilder and his collaborators to a tumour of the thyroid accompanied by so-called benign metastases. These thyroid tumours are not properly understood and, although the benign nature of the metastases has by no means been proved, the analogy to the tumour of Wilder is quite striking. It must be pointed out that Thalhimer and Murphy are not very decided in their opinion about their tumour, "it is difficult to determine whether it should be classified as a carcinoma of a low grade of malignancy or as an adenoma." Groups of tumour cells were identical in appearance with normal islands of Langerhans.

A few cells were larger than normal island cells, were irregular in shape, had enlarged hyperchromatic nuclei and were definitely atypical in appearance, as if about to undergo proliferation. Typical mitotic figures were not found. In other words the malignant nature of the tumour was not proved.

Consideration must also be paid to the conclusion of Wilder and his fellow workers that the metastases in the liver produced insulin. A malignant tumour in the usually accepted definition of the term is regarded as a disorderly growth of cells and when the cells appear as metastases in distinct organs, they continue to grow as parasites in their new situation, but they are physiologically functionless. Wilder and his fellows, as already stated, have found that alcoholic extract of metastatic tissue in the liver acted in a manner similar to that of "Insulin," when injected into rabbits. When an extract from an unaffected part of the liver was used, the effect was not appreciable in one rabbit and doubtful in another. They regarded the hyperinsulinism as being due to the action of the metastatic deposits. They refer to Jordan's work and his view that the secretion of the normal pancreas is regulated by the need of it and to the evidence that such regulation is in part neurogenic. They point out that the metastatic tumours described by them were released from nerve control by virtue of their situation and that the influences which normally govern insulin liberation, might have had no effect on them. Apart from this consideration a growth of the pancreas would interfere with the normal pancreatic activity and there is evidence that in Wilder's patient there was severe metabolic disturbance. If the functioning of metastasis be accepted (and it must be accepted with great caution) this phenomenon is against the view that the primary tumour was a carcinoma such as ordinarily occurs in the pancreas.

In regard to the metabolic disturbance in Wilder's patient, he and his collaborators showed that there was an enormous store of glycogen in the liver of the patient and that neither epinephrine nor pituitrin had an effect on this storage. They thought that glycogen was held in the liver with unusual firmness, because of the constantly maintained insulin action and that therefore it was more or less insensitive to epinephrine. They add that since the liver was filled to capacity by the large amount of sugar ingested, its glycogenic function as a reservoir was seriously impaired. Why constantly-acting insulin should interfere with liberation of glycogen is not clear. The question to be decided in this connexion is whether the metabolic disturbance was independent of the pancreatic growth or whether it was a result of the latter. No account is given of the changes which occurred in the pituitary gland. The relationship between pancreas and pituitary is so close that some light might have been thrown on the question had this been done. It seems that at present these tumours of the pancreas must be regarded as analagous to tissues of the thyroid producing hyperthyroidism and metastases.

Abstracts from Current Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

The Aetiology of Pernicious Anæmia.

STANLEY DAVIDSON (*Edinburgh Medical Journal*, June, 1928) reviews the aetiology of pernicious anæmia in the light of the newer knowledge gained by the successful treatment with a high liver diet. He refers to the work of Minot and Murphy, McCollum and Whipple in establishing liver diet in the treatment of this disease and the nature of the diet to be administered. Within ten days of commencing treatment a rapid increase in the number of reticulated red cells appears in the circulating blood. Their presence may be demonstrated by vital staining and indicates increased activity of the bone marrow. Between the second and third weeks of treatment the reticulocytes decrease and the total red cell count increases. Associated with this increase of red cells is an increase of leucocytes and platelets. Rapid improvement of the symptoms referable to the gastro-intestinal tract and nervous system occurs and clinical evidence of anæmia disappears. Reference is made to Cohn's work in the successful preparation of liver extract which in doses of five to fifteen grammes acts as efficiently as two hundred grammes of liver itself. The nature of the liver fraction is unknown. It contains nitrogen and is non-protein and appears to be of the nature of a hormone. The writer briefly reviews the physiology of blood formation and suggests that this hormone of liver extract regulates the mechanism which prevents immature cells from the bone marrow escaping into the circulation and which, in proportion to the body's needs, stimulates the proliferation and maturation of megaloblasts to normoblasts and normoblasts to erythrocytes. The "embryonic" theory of Continental investigators and the "toxic" theory of English workers as to the aetiology of pernicious anæmia are quoted and the pathological changes occurring in blood, nervous system and gastro-intestinal systems are analysed from these different points of view. The writer stresses the diagnostic importance of the achlorhydria which is invariably present in patients with pernicious anæmia and which he regards as of constitutional origin. The familial incidence of this condition is definitely proved, as is its permanency. When the stomach contents have been examined previous to the onset of the disease, free hydrochloric acid has never been found. With the absence of free hydrochloric acid in the stomach the antiseptic bar which protects the intestinal tract, is removed. As a consequence infection of the stomach with organisms from above and extension of organisms from below upwards occurs and gastric and duodenal con-

tents show a high bacterial content. The author is satisfied that the gastro-intestinal sepsis which occurs, is not associated with a hæmolytic streptococcus, but considers *Bacillus welchii* as the most likely causal agent of the chronic intoxication which must result from long-continued gastro-intestinal sepsis. As the achlorhydria and chronic intestinal sepsis are constant in remission or relapse, some other factor must be sought to account for the production of these fluctuations in the disease. The writer is satisfied that the factor is supplied by a hormone present in liver extract. In his opinion pernicious anæmia is a pathological process superimposed on a congenital abnormality. The congenital weakness may exist in any system and, except in the case of the stomach, may vary in degree in different systems. The toxin produced from gastro-intestinal sepsis affects the nervous system or liver or bone marrow most in proportion to the constitutional weakness of these systems. The most severe cases of subacute combined degeneration of the cord are those in which the symptoms due to nerve lesions appear first and are more prominent than those due to the anæmia. If the constitutional weakness exists in the liver or bone marrow, the anæmia is the predominating symptom. When the liver is the organ mainly affected, the primary cause of the anæmia will be the deficiency of the specific substance necessary for the maturation of megaloblasts in the bone marrow. The administration of liver extract should immediately produce a remission in such a patient. If, on the other hand, the bone marrow is functionally inefficient, the administration of the specific substance cannot be expected to be equally efficacious. The great majority of patients with pernicious anæmia responds promptly to treatment with liver extract and therefore it is to be assumed that the absence of the specific substance is the primary abnormality in the majority of instances. The therapeutic administration of the extract of an animal's liver supplies the patient with a preformed hormone. The cause of the deficiency of the patient's natural hormone, namely the gastro-intestinal toxæmia, remains. Hence the necessity for permanent administration of liver extract to patients suffering with pernicious anæmia.

Cultivation of the Gonococcus.

ALEXANDER MARSHALL (*Journal of Pathology and Bacteriology*, April, 1928) claims that the following medium yields luxuriant growths of the gonococcus. Human blood is drawn from patients for the Wassermann test with the usual sterile precautions and ten cubic centimetres are added to two cubic centimetres of a 2% sterile citrate solution in a sterile test tube. Centrifugalize and take off the supernatant plasma with a sterile pipette and run into a sterile test tube. Melt down tubes of ordinary nutrient agar pH 7.4 and after cooling to 50° C. add to each tube (containing

five cubic centimetres of agar) 0.5 to 1 cubic centimetre of the precipitated red blood cells. Mix the contents and slope. The inoculated tubes should be placed in a suitable wide mouthed glass jar in the bottom of which a layer of filter paper well moistened with one in one thousand mercuric chloride solution is placed. This will prevent the growth of moulds. The lid of the jar should be closed with a layer of plasticine. Incubate for twenty-four to forty-eight hours at 37° C. Typical large, grey, moist, smooth colonies appear in forty-eight hours and attain a diameter of four to five millimetres on the third day. The plasma separated from the red cells is used for subculturing and luxuriant growths can be obtained for vaccine in twenty-four hours. The plasma medium is prepared in the same way as the blood medium. If subcultured every five days the organisms can be kept alive indefinitely.

Bacteriophage in the Treatment of Cholera.

W. C. ROSS, K. N. BAGCHI, and B. C. ROY (*Indian Journal of Medical Research*, April, 1928) report the result of the treatment of cholera patients with bacteriophage. Sixteen patients were treated with only two deaths, one of which occurred within four hours of admission and another after seven hours. The bacteriophage was obtained by filtering stools from patients in whom rapid and natural recovery manifests itself. The medium used was 2% peptone water with a pH of 7.8 and the filters were Houston's pressure filters with Pasteur-Chamberland "B" candles. The treatment consisted of an injection of 0.25 cubic centimetre of cholera-phage and two cubic centimetres by mouth as soon as the patient was admitted. Two-hourly observations were recorded on all hospital patients from 6 a.m. to 10 p.m. and from a study of these records it appears that strong natural recovery begins to manifest itself within twelve hours of the onset and that if the patient can be kept alive for the first twelve hours, recovery may be expected. The authors suggest that bacteriophage should be used therapeutically and prophylactically in dealing with cholera.

Passive Transfer of the Skin Reaction to Horse Serum.

J. C. CLARKE, JUNIOR, and MAY G. GALLAGHER (*Journal of Immunology*, March, 1928) have used the passive transfer method of examining persons presenting skin sensitivity to horse serum and suggest that this method gives some hope of differentiating those whose skin alone is sensitive, from those in whom the vital organs are sensitive. By this method the authors have been able to transfer the skin reactions with the serum of all patients with hay fever and asthma in whom they have been sure that the substances giving the reaction will actually produce either hay fever or asthma in the original sufferer. There are other reactions in these persons

which cannot be so transferred, but the substances giving these reactions do not produce asthma or hay fever in that particular sufferer, although they may produce urticaria. The method consists in injecting intradermally about 0.1 cubic centimetre of serum from the person giving the positive skin reaction into the skin of a normal person. One hour later, if transfer has been accomplished, an intradermal test with the substance giving the original reaction will give a reaction in the normal person at the site where the donor's serum was injected. Twenty cubic centimetres of blood are drawn from the vein of the donor (who gives the skin reaction) and are immediately centrifugalized and the serum sterilized by filtration. The serum may then be injected directly into the skin of the recipient. It is claimed that the method deserves a further trial, as in one patient known to be dangerously sensitive to horse serum the reaction could be transferred.

The Transmission of Dengue Fever.

PAUL A. SCHULE (*American Journal of Tropical Medicine*, May, 1928) has investigated the time which must elapse before *Aedes aegypti*, having bitten a dengue patient, can transmit the disease. Volunteers for human experiments were found in sixteen soldiers. The men were housed in a mosquito-proof ward. The mosquitoes used were bred in the laboratory at the Bureau of Science, Manila. The virus used was obtained by allowing four lots of recently emerged *Aedes aegypti* to feed on four patients suffering from naturally occurring, clinically typical dengue fever. Transmission of the disease by the mosquito did not occur when the interval between the infective feed and the subsequent biting of the volunteer was two, three, four or six days, but it did occur when the interval between the infective feed and the subsequent biting was eight, ten or more days.

Immunization with Bacilli Calmette-Guérin.

E. NOBEL (*Wiener Medizinische Wochenschrift*, June 2, 1928), after reviewing the theories of Calmette regarding the immunization of infants against tuberculosis, declares that the fear of early infection by this treatment is justified. He gives the histories of seventeen children who received subcutaneous injections of bacille Calmette-Guérin. Three of them died, one from meningitis, the second from broncho-pneumonia following measles. Although no *post mortem* examination was permitted, the latter death is significant in view of the relationship between measles and tuberculosis. The third death was caused by convulsions which were possibly due to tuberculous meningitis. He also reminds Calmette that a failure to react to the von Pirquet test in older children does not absolutely exclude tuberculous infection. Calmette's researches are of great inter-

est, but at this stage until further animal experiments have been performed, it is not justifiable to expose infants to a very real risk of infection.

HYGIENE.

Infections with *Ancylostoma Caninum* in Dogs.

C. A. HERRICK (*The American Journal of Hygiene*, March, 1928) points out that Sawyer, from a statistical study of data secured by various workers, concluded that the hookworm population in a community, like any population group, tends to reach an equilibrium. He suggested that the number of worms is not only dependent on conditions favourable for the development of the larvæ, but also on the resistance encountered by the worms within the host. In other words, although conditions may be ideal for the development of infective hookworm larvæ and for the exposure of the host to infection, the number of hookworms does not increase indefinitely. Such a course in community infections must obviously be related to the course of the infections in the individual host. Since the factors which influence the establishment of such an equilibrium in an individual are not readily studied in the human, an attempt was made to get at some of them by the study of *Ancylostoma caninum* in the dog. With the dog as an experimental host it was not only possible to infect with a known number of larvæ and prevent accidental infection, but the number of worms developing from the larvæ given can be determined by killing the host. It was desired in many instances to study the progress of infections, especially their building up, due to repeated exposures to larvæ. It was necessary also to use a method of estimating the number of worms present without destroying the host. This was found to be possible with a certain degree of accuracy by using the egg production of the females as a measure of the number of worms present. The technique of determining the number of eggs produced was the dilution egg-counting method described by Stoll and Stoll and Hausheer. To test the dependability of the egg production of the worms in dogs as a measure of their number it was first necessary to analyse all of the egg counts available in which the relation of the count to the number of worms was known. It was found that while egg counts varied with different conditions, they were a very useful measure in certain phases of work. Fifty-five dogs were used in the study. From a study of the hookworm infection in these dogs the following conclusions were drawn. The important factors in affecting the egg-worm ratio were: the age of the worms, the proportion of worms found in copulation and the proportion of males and females. The numbers of eggs produced by female hookworms increased very considerably with their

age, so that in all estimates of worm numbers from egg counts the age of the worm must be considered. The average number of eggs per gramme produced by a female of *Ancylostoma caninum* was found from a study of the infections of 19 dogs to be 440, and the average number of eggs per day was approximately 10,000. The average number of eggs per day was considered to be a better measure of an infection than eggs per gramme, because it was less variable and it more nearly estimated the number of worms found at autopsy. Older dogs were found to be more resistant to *Ancylostoma caninum* than younger ones, since it took longer for the worms to reach sexual maturity and since the proportion of larvæ which developed decreased greatly with age. No increase in resistance could be demonstrated in dogs which had been previously infected, when all the worms from the previous infections were removed with anthelmintics, although in certain cases in which worms were present from previous infections, there seemed to be increased resistance to the superimposed infection. When a given infection was followed by the egg count, a peak of egg production was reached about fifteen to twenty days after the first egg was found. After this the number of eggs produced greatly decreases, apparently on account of loss of worms until a general level is established. By using a known number of larvæ, following the course of the infection with the egg count and terminating it at any point determined by autopsy, a quantitative method of study was established, by which the results given in this paper were obtained.

Chronic Benzol Poisoning Among Women Industrial Workers.

ADELAIDE ROSS SMITH (*The Journal of Industrial Hygiene*, March, 1928) in the summer and autumn of 1926 made a study of women workers exposed to benzol in New York State with the object of securing data with respect to the prevalence of unrecognized chronic benzol poisoning and its earliest signs and symptoms. Six factories, distributed among the large industrial centres of the State, were investigated and examinations were made with but few exceptions of all the women who were exposed to benzol. The criteria upon which a presumptive diagnosis of benzol poisoning was based, were the same as those employed by the Benzol Committee of the National Safety Council, namely, a history of exposure and a reduction of 25% or more in the white cell content of the blood (bringing it down to 5,625 cells per cubic millimetre or less from the normal 7,500). In Factory I, a tire and rubber goods plant, benzol was used freely throughout the factory and no precautions were observed by the management. Of the ten women examined in this plant, two undoubtedly suffered from poisoning and one was suspected. Factory II was a camera manufacturing plant and women came into contact with benzol in two ways—through working

with a benzol-rubber cement and through applying with a spray gun a lacquer containing benzol. Thirty-three women used benzol-rubber cement and of these eleven suffered and one was suspected to be suffering from poisoning. Eight women were engaged in spray lacquering with a lacquer containing 4% by volume of benzol. The work was done under hoods, but in most instances owing to faulty construction and ventilation the sprayed lacquer could be seen blowing among the workers' faces. Five of the eight gave definite evidence of benzol poisoning. Factories III and IV both manufactured sanitary tin cans. The sanitary tin can industry is the one in which most of the cases of chronic benzol poisoning among women have so far occurred. Benzol is the solvent in a compound used to line or coat a groove around the circumference of the tops and bottoms of cans. This lining acts as a gasket and permits the ends of the cans to be attached to the bodies in an air-tight manner. The benzol problem in these factories was known and as a result a ventilating system for the coating machines had been evolved and appeared to be efficient. Altogether ten women were examined in these two plants, but in spite of the good ventilation two were found to be suffering from poisoning. Factory V also manufactured sanitary tin cans and used benzol in its lining compound, but the problem of ventilation had been coped with in a far less satisfactory manner. Of the fifteen women examined, four were definitely affected by and three were suspected of suffering from benzol poisoning. Factory VI was a large shoe manufacturing establishment employing about six hundred women, but only three came into contact with benzol; two applied benzol rubber cement to crepe rubber soles with no local exhaust ventilation and the third worked near by. One of these women was found to be suffering from benzol poisoning. In all seventy-nine women were examined and of these 25 or 32% manifested blood changes which were sufficiently pronounced to indicate clearly that benzol poisoning was present, while in five more the condition was suspected. The ages of the women examined ranged from seventeen to fifty-two years, but it would appear that age does not appear to be a predisposing factor in the production of benzol poisoning. Among those suffering from benzol poisoning the shortest exposure was two months. The most prominent characteristics of the appearance of these women were pallor and a look of fatigue. Spectacular manifestations, such as bleeding from the mucous membrane and purpura, were conspicuously absent; headaches occurred in 60%, excessive fatigue in 46.7%, dizziness in 43%, nausea in 33% and a feeling of weakness or of general muscular inefficiency in 26.7% of the patients. The red cells and hemoglobin were reduced relatively much less than the white cells, no counts in the series being lower than 3,000,000 per cubic millimetre. The white cells in the affected

women ranged between 2,300 and 5,600 per cubic millimetre. A diminution in the percentage of polymorphonuclear leucocytes is generally reported as characteristic of chronic benzol poisoning. In this series there was such a tendency. The average percentage of polymorphonuclear cells was 53 as against the normal 60 to 70, but a reduction in percentage was not invariably shown. One variation from the normal which appeared in almost half the cases, was an increase in the endotheliocytes, a term now widely used to include cells formerly known as large mononuclear and transitional cells. These cells normally constitute from 2% to 6% of the total number of leucocytes. Fifteen out of twenty-eight or 53.5% manifested an increase above 6% and in one instance the increase was as high as 19%. In one of the reported cases there was at one time an endotheliocytosis of 27%. In two instances an eosinophilia was present, while basophile or mast cells were slightly increased in a fairly large number of patients and suspected persons. Myelocytes were seen in more than 50% of the blood smears. Summarizing the blood examinations, it may be said that evidence of a pathological condition was shown by the anemia, the appearance of the red cells, the reduction in white cells, the presence of abnormal cells such as myelocytes and Türk's irritation forms and the abnormal increase in endotheliocytes. In addition to the cases found on examination, reports were obtained of three affected persons, two of whom died; both of these had advanced to the point requiring admission to hospital.

Tests for Drunkenness.

GODFREY CARTER (*The Journal of State Medicine*, May, 1928) points out that in the absence of any statutory definition of what constitutes intoxication, there is bound to be a welter of assertion, denial and destructive criticism of methods employed during the hearing of a charge of drunkenness. The signs and symptoms of alcoholic intoxication have been considered, summarized and pronounced upon by a committee appointed by the British Medical Association. The medical examiner's chief difficulties, however, are connected with the milder forms of intoxication and any assistance founded upon scientific data which enables a conclusion to be drawn with the minimum fraction of possible error, is very valuable. Mellanby and Southgate have carried out certain researches in connexion with the estimation of alcohol in the blood and urine. A definite quantity of alcohol was administered during a period of fifteen minutes to a number of fasting men. Alcohol was found in the blood soon afterwards and in increasing amount up to one and a half hours after the drink had been taken. From then it began to decline at the rate of about twelve milligrammes per hour, until all trace had usually disappeared in about twelve and a half hours after consumption. The blood content was found to be

about 148.7 milligrammes of alcohol in 100 cubic centimetres at the point of maximum concentration. It was found that one part of alcohol in the blood gave 1.35 in the urine secreted at any given time. Therefore the drinking of 235 cubic centimetres of absolute alcohol gave 148.9 milligrammes in the blood and 200 in the urine. A further and somewhat surprising fact also became evident, namely that the alcoholic secretion into the urine was a constant factor and was independent of its concentration. The absence of kidney disease and diabetes has been assumed in the foregoing statements. The following conditions may also modify the results obtained: the presence of food in the stomach which delays the absorption of alcohol, the rate of drinking, the weight of the body and the dilution of the liquor consumed. One man may become intoxicated after consuming a stated amount of alcohol and another, a toper, may be sober under the same conditions or even after taking a larger quantity than the other. This may be explained by assuming that there is delayed absorption in the case of the habitual indulger and this has been proved by blood analysis. It is the amount of alcohol present in the blood and subsequently discovered in the urine which accounts for the presence or absence of drunkenness and not how much that has been consumed to produce the effect. When the blood alcohol content reaches a certain figure, signs of intoxication will develop and become manifest and not until then. Once this point is appreciated, misapprehension and doubts will disappear and the value of urine analysis will appear in its true light. The rate of diminution in the blood content is about 12 milligrammes per hour and 16.5 in the urine. If, therefore, two samples are obtained, the second after an interval of an hour, two facts become evident. First it can be ascertained if the tide is rising, enabling an estimate to be formed on a chart as to when the high mark will be reached. Secondly, if the tide be falling, then by noting when the samples were voided and by drawing a line through both readings and continuing it backward, the summit figure can be estimated, it being known that all chance of obtaining more drink was stopped by arrest. The method and apparatus used for urinary analysis are described. Only two cubic centimetres of urine are required and the time occupied is within an hour. The analysis determines the number of milligrammes present in one hundred cubic centimetres of urine. The analytical result having been obtained, there only remains a simple proportional sum.

Anti-tuberculosis Work in the United States.

LINSLEY R. WILLIAMS (*The World's Health*, February, 1928) believes that the people of the United States have developed a certain type of civilization which has not been seen in any other country of the world. One particular feature of this civilization is

the voluntary effort to find a parallel or a substitute for government. Prior to 1904 the efforts to eradicate tuberculosis were limited to a few agencies in the larger cities, but several health departments had already instituted a vigorous attack. As an example of the eagerness of many Americans in endeavouring to persuade their fellow men by all possible means and agencies to agree to a certain method of conduct, the National Tuberculosis Association was organized in 1904. The founders saw clearly the possibilities of prevention of this disease and their social workers were perhaps the first to appreciate that tuberculosis is a disease of the poor and that large families, low wages and bad housing are almost synonymous with tuberculosis. From the outset the Association has generally believed that tuberculosis is largely a governmental problem, that private funds can never be secured in sufficient amount to care for the tuberculous sick, that voluntary agents cannot wholly undertake a health department function and can undertake some functions not at all. The official governmental agency should find the tuberculous patient, register him, care for him in sanatoria or hospital and employ nurses to instruct him and his family. Further, these health departments should also provide the necessary dispensaries, travelling clinics, physicians, nurses and all the paraphernalia to find the patient, care for him, cure him, supervise him, protect his family and others. As these facts are generally admitted, the author asks why voluntary organizations should exist. The interested citizen is not satisfied with government; he says it is slow to act, its employees are inefficient or they have no vision, there is too much routine, the machinery is never complete nor does it run smoothly. This is, however, true only in part; but in order to rouse the people citizens group themselves together and form committees and associations which stimulate government activity, bring about the enactment of new laws, secure larger appropriations and as a last resort criticize a health official and his policies. Prior to 1919 the National Tuberculosis Association was called the National Association for the Study and Prevention of Tuberculosis. There are now fifty-three associations directly affiliated with the National Tuberculosis Association, as well as thirteen hundred local associations and several hundred loosely organized committees. The programme of activities of the Association is based on the principle that tuberculosis is communicable, preventable and curative, that infection takes place early in life, that hygienic living diminishes the likelihood of the development of the disease and that isolation of those with open tuberculosis and proper care and supervision of all known sufferers will materially reduce its further spread. The Association has conducted surveys in particular localities to ascertain the number of patients with tuber-

culosis under the care of private medical practitioners or in attendance at hospitals or dispensaries. These surveys have shown that there are at least ten patients to each annual death. Earnest efforts have been made to introduce health education into the curricula of public schools. One of the most important features of the work of the Association has been the fostering of research. In the United States, the States, counties and cities maintain 312 hospitals and sanatoria with 38,097 beds; about 600 permanent dispensaries; 2,000 health officers and 11,000 nurses engaged in public health work, nearly half of the latter doing some tuberculosis nursing. The cost of these institutions and of the personnel of health departments amounts to over fifty million dollars per annum.

Arsine Poisoning in the Steel Industry.

C. W. MUEHLBERGER, A. S. LOEVENHART and T. S. O'MALLEY (*The Journal of Industrial Hygiene*, May, 1928) state that a total of two hundred and forty-seven cases of poisoning by arsine or arseniuretted hydrogen has been reported in medical literature since 1815. The toxic agent in practically all of these instances was produced during the interaction of metals and acids which contained arsenic. Whenever hydrogen gas is generated in a chemical reaction where arsenic is present, a portion of the arsenic will be evolved as arsine. The pickling of sheet steel constitutes an extensive industry. The occurrence of definite arsenic poisoning in an employee engaged led to a careful survey of the danger of arsine intoxication in this industry. The pickling process consists of cleaning rolled steel sheets in tanks containing 5% sulphuric acid heated to 82-2° C. (180° F.). After careful analyses of the materials used and of the air in the neighbourhood of the pickling tanks, the authors conclude that in the pickling of iron and steel products, as now carried on, there is no danger of arsine poisoning as long as the pickling acid used is free from arsenic. The purchasing of pickling acid should be made on specifications limiting the arsenic content to one part per million and each shipment of acid should be analysed for arsenic to guard against arsine poisoning. Inasmuch as commercial sulphuric acid containing less than one part per million of arsenic trioxide is obtainable at very reasonable cost, arsine poisoning in the pickling industry is inexcusable. With respect to the employee in question it would appear that the poisoning was due to arsenic received by the mouth and not to exposure to arseniuretted hydrogen.

Bacterial Pollution of Bathing Beach Waters.

C. E. A. WINSLOW and DAVID MOXON (*The American Journal of Hygiene*, May, 1928) state that the possibility of acquiring intestinal infections by bathing in polluted waters is an obvious one, although the actual extent

of the danger involved is difficult to estimate. The problem of pollution of bathing beaches has long been an important one for the city of New Haven. The entire sewage of the city, amounting to 20,300,000 gallons a day, is discharged into a harbour with a tidal prism of eight billion gallons a day, amounting to a total dilution of one part of sewage in four hundred parts of water. The backing up due to ebb and flow of the tide and the fact that the harbour has a rather narrow channel with shallow areas along the shore, however, make the local pollution at many points far exceed the average. The public beaches are used by thousands of persons every week during the bathing season. In the present study samples were collected at each harbour station on eleven different days in the period from November, 1926, to April, 1927. From examination of these samples it is evident that the bathing beach waters of New Haven harbour were highly polluted. The samples averaged 949, 2,439 and 3,084 bacteria per cubic centimetre on agar at 20° C. and 14, 19 and 68 *Bacilli coli* per cubic centimetre on eosin-methylene-blue plates. Judged from any standard, the waters are so heavily polluted as to be manifestly unfit for bathing and the necessity for the adoption of plans for sewage treatment, including chlorination during the bathing season, is emphasized.

Sanitary Quality of Some Commercial Milk Powders.

J. H. SHRADER, C. L. EWING, F. A. KORFF and LILLIAN W. CONN (*The American Journal of Hygiene*, May, 1928) state that the increasing use of milk powders in food products, together with the higher sanitary plane to which the ice cream industry is aspiring, has directed attention to the question of sanitation in this more or less neglected branch of the dairy industry. Since reconstituted milk is similar to natural milk in so many respects, it is a public health necessity that the same conditions of sanitation should obtain in the one case as in the other. Analyses were made of one hundred samples of milk powder taken from grocery stores, bakeries, confectioneries and drug stores, widely scattered over Baltimore. Plate counts made according to standard methods of milk analysis of the Public Health Association, 1923, ranged from 1,000 to 3,140,000 bacteria per gramme, while breed counts ranged from 2,100,000 to 37,000,000 per gramme. In not one single instance were viable tubercle bacilli found. The enormously high bacterial content of the milk before manufacture is confirmed by a chemical measure of the decomposition of the milk through bacterial metabolism. The chemical analysis of seventy-four of the samples showed that an excessive bacteria count before manufacture is indicated by the presence of an approximately proportional content of ammoniacal products. It has been shown that the milk powders are not handled in a sanitary manner.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SECTION OF OTO-RHINO-LARYNGOLOGY OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, 30-34, Elizabeth Street, Sydney, on July 24, 1928, Dr. R. S. GODSALL in the chair.

Ionization in Oto-Rhinology.

Dr. A. J. CAHILL read a paper entitled: "Electric Ionization in Oto-Rhinology" (see page 288).

Dr. HERBERT MARKS complimented Dr. Cahill on his paper. He himself had obtained excellent results in suitable cases of chronic suppurative *otitis media*. He emphasized the importance of very gradually turning the current on and off, as otherwise the patient experienced a severe shock. He asked what method Dr. Cahill used to keep the cavity full of the solution as there was frequently a continual leakage down the Eustachian tube.

Dr. J. J. WOODBURN thanked Dr. Cahill for his paper. He inquired whether Dr. Cahill had used ionization in cases of atrophic rhinitis.

Dr. RAMSAY BEAVIS thanked Dr. Cahill for his interesting address. He asked him whether he had experienced difficulty in inserting a plain zinc needle into the inferior turbinal for electrolysis, on account of its tendency to bend very easily and whether a zinc coated steel needle was a satisfactory substitute.

In reply Dr. Cahill mentioned two methods of keeping the ear cavity full of solution. A vulcanite Siegel's speculum could be used attached by a rubber tube to a vessel containing the solution; from this a continuous and easily regulated flow of the solution to the middle ear cavity could be maintained. A simpler method was to keep the cavity filled by occasionally instilling the solution into the external meatus with an ordinary eye-dropper.

Some authorities had found ionization of the nasal cavities useful in atrophic rhinitis when combined with autogenous vaccines and daily irrigations. The fœtor was controlled, but complete cure was not to be expected.

Insertion of the needle along the inferior turbinal was assisted by making a small stab incision at the anterior end and then keeping the needle close to the bone. The needle should be triangular in cross section, sharply pointed and previously hardened by hammering. Zinc coated steel needles were easier to insert, but after being used once or twice the zinc coating became worn away and the needle was then very irritating to the tissues.

Dr. GODSALL proposed a vote of thanks to Dr. Cahill for his very instructive paper. Such good results were now being obtained by ionization that he considered that the large hospitals should obtain the necessary equipment and that one of the honorary assistant ear, nose and throat surgeons should be specially trained in this branch, in order to take full charge of the patients. This step would be well justified if even a small percentage of patients could be saved from a large operation such as the radical mastoid.

The vote of thanks was carried by acclamation.

Dr. Cahill gave a demonstration of ionization on selected patients at the Royal Prince Alfred Hospital on July 25, 1928.

A MEETING OF THE OBSTETRICAL COMMITTEE OF THE QUEENSLAND BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the B.M.A. Building, Adelaide Street, Brisbane, on July 24, 1928, Dr. GIFFORD CROLL, the President, in the chair.

Quarterly Report.

The report of members' cases, received during the quarter, was presented by Dr. F. A. H. MICHÖD. The results of the instrumental deliveries and the occipito-posterior presentations were presented to the members in tabular form.

Still-Births.

A discussion took place in regard to two of the five still-births which had occurred during the quarter.

The first patient had had nine children. She had had eclampsia seven times, all children being still-born except one. On ante-natal examination the urine had contained albumin. The presentation had been a breech. The fetal heart had stopped beating two days before birth. The fœtus had been macerated on delivery.

Dr. A. C. F. HALFORD wanted to know if the condition was one of nephritis or one of eclampsia and thought it would be worth while if the members were asked for more information in this regard.

Dr. ELLIOTT SMITH wanted to know whether fits occurred.

Dr. HALFORD asked what should be classified as eclampsia.

Dr. K. WILSON said that the Statistical Committee worked on the definition of a fit as a condition of unconsciousness with or without convulsions.

Dr. ALEX. MARKS related the history of a patient whom he had recently attended. Her urine had been free from albumin antenatally, but when labour commenced the nurse had told him that the patient had had a fit. He had arrived to find the os fully dilated, so forceps had been applied and the delivery completed. She had had no more fits and no albumin in her urine during the puerperium. The question arose as to whether the condition was one of eclampsia or epilepsy.

Dr. GIFFORD CROLL referred to a patient whom he had been called in to see because she was having a fit. She had been eight months pregnant and was attending the antenatal clinic at the Lady Bowen Hospital. She had been suffering from epilepsy.

In the second case the fœtus had been macerated and had had a slight degree of hydrocephalus. It had been estimated as three weeks post-mature. The fetal heart sounds had been heard until four days before labour commenced. Labour had been preceded by several attempts at induction by medical means.

Dr. ALEX. MARKS asked how the member who conducted the delivery had estimated that it was overdue. He said that the patient might have been wrong in her dates and not overdue.

Dr. C. G. CROLL said that he was always guided by the size of the child's head relative to the mother's pelvis in deciding upon induction. He said there was no necessity for induction, if the head fitted the brim.

Dr. F. A. H. MICHÖD said that, in helping to decide on the necessity for inducing, he found a good guide was the gradually increasing upward extension of the fundus. This could easily be measured with accuracy at each successive antenatal examination. He also used in conjunction with this the estimation of the size of the fetal head relative to the mother's pelvis.

Eclampsia.

Two cases of eclampsia were reported.

Mrs. F.R., aged forty years, was to have her third confinement. The estimated date of confinement had been May 15, 1928. Her previous obstetrical history had not been abnormal apart from twins ten years previously. Her urine had been free from albumin until one week before labour commenced. The patient had been admitted to a maternity home in a grave condition on April 27, 1928. Her pulse had been imperceptible, she had been very dyspnoic, orthopnoic and cyanosed and her urine had been solid with albumin. She had been given morphine and calomel. On April 28, 1928, her condition had slightly improved, but her legs and abdominal wall had been oedematous and she had had oedema of the lungs. At 10 p.m. induction of labour had been begun by means of elastic bougies inserted into the uterus without anaesthesia. The child had been born alive on April 29, 1928, at 7 a.m. Her condition had steadily improved and on May 8, 1928, her urine had been clear.

Mrs. T.M., aged thirty years, had been pregnant for the first time. The estimated date of confinement had been March 2, 1928. Her urine had been clear one week before labour commenced. The patient had commenced to lose

liquor amnii on March 11, 1928. On March 12, 1928, she had had definite labour pains. At about 8.30 a.m. without any premonitory signs, she had had a fit. She had been given a bowel and stomach washout. The pains had increased in severity, but no dilatation of the os had occurred. The patient had had four fits during the day. Manual dilatation of the os had been attempted and the os had dilated to the size of half a crown. On March 13, 1928, further manual dilatation of the os had been attempted. There had been no more fits. On March 14, 1928, dilatation had been completed manually and the child removed by instruments. The child had been alive, but died on the fourth day from cerebral hæmorrhage. The patient had had a hard leathery cervix.

Dr. ELLIOTT SMITH said it would be interesting to know whether the blood pressure readings were noted. He found the high readings in these types of cases interesting.

Dr H. S. WATERS said it was interesting to note that the results of the urine examinations had been normal one week before the onset of labour and that the first symptom was a fit. It showed the necessity of frequent urine examinations and blood pressure readings. He would like an opinion as to how long it was advisable to wait in cases of eclampsia for dilatation of the os before attempting some method of delivery.

Dr. ELLIOTT SMITH said that this could not be answered off hand, as it depended on the method of treatment the practitioner followed. Personally he would never dilate the os and would never interfere until the os was fully dilated. He treated his patients by the eliminative method and left them to a natural delivery.

Dr. F. A. H. MICHON looked upon the condition of the blood pressure as a good guide in eclampsia and he considered the outlook favourable if the fits were reducing in number and severity. In a recent analysis of five hundred patients confined at the Lady Bowen Hospital, eclampsia had occurred six times with neither maternal nor fetal mortality.

Dr. C. E. TUCKER asked whether morphine had a bad effect in eclampsia, as it was supposed to be harmful in nephritis.

Dr. A. C. F. HALFORD thought the fear of morphine in nephritis was a bogey.

Premature Confinement.

Case No. 152 was then read and discussed.

Mrs. J., aged thirty-seven years, had been pregnant for the fourth time. The estimated date of confinement had been March 25, 1928. The patient had had one miscarriage at the fourth month three years previously. Her third confinement, nine years previously, had terminated in a precipitate birth. Her second, fourteen years previously, had been normal and her first, fifteen years previously, had been an instrumental delivery. This case was of interest in that the two last pregnancies had ended, one at the fourth month with miscarriage, and the one under discussion at the end of the seventh or beginning of the eighth month, from causes unknown. No blood examination had been made. The cessation of the pregnancy a full month before the due date evidently resulted in the separation of the placenta which remained in the uterus with the fetus. It was assumed that the placental site had healed because the placenta was bloodless, compact and shrivelled and the lochial discharge was very slight, practically ceasing in a week. The patient had been allowed up on the fifth day and had gone home on the seventh, feeling well and strong. The child had been born macerated two weeks over the estimated date of confinement.

Dr. ALEX. MARKS thought the history of the miscarriages was suggestive of a syphilitic condition and raised the question as to whether, if she were found to be syphilitic, she should be put on to treatment for the condition and kept in ignorance or whether she should be informed.

Dr. C. G. CROLL said that in a case of such a type even if the Wassermann test did not give a positive result he would put the patient on to antisyphilitic treatment. He had had experience of a typically syphilitic child both the mother and father of whom had failed to give a Wasser-

mann reaction. He had put the mother on to antisyphilitic treatment and her next child had been healthy and had manifested no stigmata.

Dr. A. C. F. HALFORD thought that treatment should be advised and carried out. He had found grey powder very useful.

Dr. ALEX. MARKS said that in his experience the patients did not tolerate iodides well, but Donovan's solution was well tolerated over long periods.

Dr. H. J. BROWN mentioned the fact that if syphilitic parents kept on having children, they eventually produced a live one without any treatment.

Case 183 was then read and discussed.

Mrs. B., aged thirty-five years, had been pregnant for the sixth time. The estimated date of confinement had been March 13, 1928. The patient had had no miscarriages. Her first and second children were living. In the third confinement the presentation had been a breech with extended legs and arms and prolapsed cord. The position had been left sacro-anterior, a female child weighing 6.3 kilograms (fourteen pounds) had been still-born at full term. The placenta had been adherent and manual removal had been necessary. In the fourth confinement the presentation had again been a breech, the child, a male, had been born in the right sacro-anterior position at full term. It had been still-born with extended legs and had weighed 5.4 kilograms (twelve pounds). The fifth confinement had also been abnormal. When the patient was examined during labour, the os had been fully dilated and the hand and cord had presented. The hand and cord had been replaced and the forceps applied to the head and the child extracted. It was full term, male, living and had weighed 4.5 kilograms (ten pounds). In the sixth confinement, the one under discussion, delivery had been natural and had occurred six days before the estimated date. The child had been born alive in the left occipito-anterior position, had been a full term child and had weighed five kilograms (eleven pounds). The puerperium had been uneventful.

Dr. C. S. TUCKER asked whether in a case of prolapse of the cord in a vertex presentation, version and changing the presentation to a breech were of any value. He had found these cases very difficult to manage.

Perineal Laceration.

Dr. A. C. F. HALFORD gave a short address on the subject of perineal laceration. He said that he wished to stress especially the prevention of laceration. The most favourable presentation with the smallest diameter of the child's head was a *sine qua non*. When the head began to show after a long and tedious labour, the *accoucheur* was liable to think he was near the end of the delivery, but this was just the time that patience should be exerted to the full extent. Precipitate labour and instrumental delivery both carried a grave risk of causing laceration. Patients while pregnant should have regular moderate exercise. During delivery of the head the head should be retarded instead of hurried, so as to allow gradual stretching and distension of the perineum. It was important to maintain flexion of the head by pressing the presenting part against the pubes. This was best done at the end of a pain or between the pains. In regard to the question of anaesthesia as the head was being delivered, his experience showed it was best to administer deep anaesthesia or no anaesthesia. The reason was that light anaesthesia allowed the mother to exert influence on the oncoming head by bearing down. It was much safer to allow the head to be expelled by uterine contractions which were not so forcible as those exerted by the auxiliary abdominal muscles. If the patient was not sufficiently anaesthetized, the agony at this time was not appreciated and all the muscles acted in an effort to expel the child, making it practically impossible to prevent the head coming through quickly. Chloroform checked these pains, but it was better to put the patient under the anaesthetic deeply and allow the head to be born in the absence of pains. Another point of importance was to maintain flexion. The occiput should be kept pressed against the pubes. It was advisable to see that no soft parts came down and got pinched between the head and the pubes. This was important as it interfered with delivery and aggravated the risk of laceration. Some-

times he had been able to ease the occiput over the pubes at an early stage by bringing about extension of the head, but it was necessary to be careful in this manoeuvre and only possible with a dolicocephalic head. He said that before the perineum stretched to any extent, he always attended to the position of the patient's lower extremities. For many years he had kept the thighs well flexed on the abdomen during delivery, but he now got the nurse to refrain from allowing excessive flexion. The proper position for birth of the head was with the legs extended and the thighs should not be flexed on the abdomen on any account. He said that after the head was born, the question of managing the shoulders cropped up. It was of advantage to allow the anterior arm to be born and then the shoulder. By continuing the movement the body of the child was swept up towards the mother's abdomen. This was especially necessary in cases of forceps delivery. When the head had been born and the perineum torn, he was careful not to hasten birth of the child. He kept the chloroform going and surveyed the position. If the case was hurried at this stage, the laceration was likely to be aggravated. The arms should be freed, the shoulders should be born between pains and the child delivered toward the mother's abdomen. In regard to suturing the perineum, he said it was useful to do this before the expression of the placenta. A bulky sterile swab was inserted. This gave a good view of the damaged area and enabled the laceration to be sewn up with good approximation of the injured parts. The swab was slowly removed and the effect of the suturing inspected. It was his custom always to apply bulky antiseptic pads, such as five or six folds of boric lint to the perineum in these cases. It was a safe and convenient pad for dressing. In regard to episiotomy, he said he could never estimate when a perineum would rupture. He had never performed it and never intended to. It meant inflicting a wound on a patient which she might or might not have had. He could not see that it was justified.

DR. F. A. H. MICHON thanked Dr. Halford for his lecture and said that he had given the details fully. He said it was common to get a small tear of the fourchette and some part of the skin of the perineum without involving the perineal muscles. He thought that in this type of tear it was an advantage to perform episiotomy. He thought it was possible to foretell the perineum which would tear. In connexion with breech delivery, he mentioned Potter's method of vaginal massage which gave a much bigger outlet.

DR. ELLIOTT SMITH thought that Dr. Halford had covered the field in his address. He found no cause for argument in what the speaker had said, and agreed with his remarks on episiotomy and thought that chloroform, properly administered, was the best method of saving the perineum. He had used Potter's method of treating the perineum and did not get tears when he adopted it. He hoped the absence of tears was due to the method. He then described the way in which he ironed out the vaginal outlet. In regard to the conduct of breech delivery in *primiparae*, he thought that the *accoucheur* was generally in too much hurry. After the nose and mouth of the child were born there was no need for haste and the rest of the delivery could be delayed for some time without danger. He had seen cases in which the head had been born without a perineal tear, but in which the shoulders had caused a tear.

DR. C. E. TUCKER thanked Dr. Halford for his address and agreed with what he had said about chloroform. As regards instrumental delivery, he thought it was an important point to remove the forceps from the child's head just before the head was born. He thought that many tears of the perineum were caused by the head, but the blame was laid on the shoulders. In regard to episiotomy, he said that he never performed it in a vertex presentation, but he used it in breech deliveries just before the birth of the head. He performed lateral episiotomy, one incision on each side and found it very useful, especially in *primiparae*. He had found it helpful at times when delivering the head in a vertex presentation, to push the anterior part of the vulva on to the neck of the child just before delivery was accomplished. In

regard to repair of the perineum, he thought it was not sufficient to suture the perineum without suturing the vaginal mucous membrane.

DR. H. S. WATERS thanked Dr. Halford for his address and asked him at what stage he put the patient under deep anaesthesia. He was confused in the matter of pressing the head of the child against the pubes to promote flexion. To him it appeared to cause extension and not flexion. In regard to the position of the patient, he said a correct position was important, as flexion of the legs increased the tension on the perineum. In regard to the necessity of hurrying the birth of the child after the head was born, he had found it a useful index of the child's condition if the head was tapped smartly and the colour which appeared, was noted. If blueness took a long time to return after tapping, it indicated a need for not delaying the birth of the child.

DR. HEDLEY BROWN said he was interested in Dr. Halford's address. In regard to anaesthesia, he said that chloroform caused labour pains to cease and asked if pituitrin should not be used. He thought that it was best if the head was born with the sagittal suture lying in the antero-posterior diameter of the outlet. This meant that the pressure on the *levator ani* was equal on both sides and helped to prevent tears. He said there was a type of perineum which would tear in spite of every care. By emptying the bladder and so getting more room, it was possible to prevent tears in some instances. In regard to the position of the patient during labour, he found the best position was one in which the lower extremities were midway between extension and a right angle. In regard to the suturing of torn perineum, he used silkworm gut passed through the skin, *levator ani* and mucous membrane.

DR. H. CRAWFORD said he had appreciated Dr. Halford's remarks and agreed with the position of the patient for delivery. He agreed that anaesthesia was useful in stopping the voluntary bearing down of the patient. He agreed with Dr. Tucker that forceps should be removed from the child's head just before delivery was completed. In regard to suture of the torn perineum, he used buried chromicized gut for the *levatores*, surface sutures of catgut for the vaginal mucous membrane and separate sutures for the perineum. He had found kangaroo tendon much more comfortable for the patient than silkworm gut.

DR. K. WILSON said that he was one of the chief offenders in regard to episiotomy. He thought he could judge fairly accurately as to whether a perineum would tear or not and did not hesitate to perform lateral episiotomy if a tear appeared unavoidable. He thought an episiotomy wound was easier to suture correctly than a perineal tear and that the ultimate functional result was better and more permanent than in the case of a repaired perineum.

DR. C. D. CROLL agreed with all Dr. Halford's remarks, but in practice did the opposite. He had found the following a successful method: instead of pressing the head against the pubes, to press it against the perineum and away from the pubes. If the perineum seemed to be commencing to tear, he relaxed the pressure and this relieved the perineum. This method promoted flexion of the head and made it easy to watch the perineum. He gave the method as a suggestion. In regard to episiotomy, he said he had done it occasionally and thought it was possible to tell when the perineum would tear. In the latter case it was useful to do an episiotomy, because he then knew where the tear was going. He agreed with Dr. Waters that if the patient would permit, it would be convenient to suture the tear next day.

In reply, Dr. Halford said he could not cover all the points in the time at his disposal. He thought that Dr. Brown's point about the full bladder was very cogent. In regard to the time for inducing deep anaesthesia, he said the proper time was when preparing to deliver the head. There was one tip he forgot to mention. In determining the depth of anaesthesia, he tested the uterine contractions by firm traction on the perineum with the fingers. In breech deliveries he always used traction on the perineum in preparation for the delivery. By traction on the perineum it was possible to induce uterine contractions.

He never used pituitrin for this purpose. As regards the time for suturing the perineum, he performed it before the third stage because the patient was anæsthetic and the perineum was anæsthetic. He said that the time for so doing was appropriate and there was less likelihood of hurrying the third stage. He thought Dr. Croll's method a very good one, but he had not used it.

NOMINATIONS AND ELECTIONS.

THE undermentioned has been nominated for election as a member of the New South Wales Branch of the British Medical Association:

Hudson, Mary Joyce, M.B., Ch.M., 1926 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.

THE undermentioned have been elected members of the Victorian Branch of the British Medical Association:

Pardey, Geoffrey James, M.B., B.S., 1928 (Univ. Melbourne), Melbourne Hospital.
Gowenlock, David Evans, M.B., B.S., 1927 (Univ. Melbourne), Alfred Hospital.

THE undermentioned has been elected a member of the South Australian Branch of the British Medical Association:

Cashmore, G. H., M.B., B.S., 1927 (Univ. Adelaide), Adelaide.

Medical Societies.

THE MEDICAL BENEVOLENT ASSOCIATION OF NEW SOUTH WALES.

WE have been requested to publish the following communication from the Honorary Treasurer of The Medical Benevolent Association of New South Wales:

The following details of the help afforded to beneficiaries during the past year will be of interest to members of the Association:

Mrs. —, widow of medical man, has four children. Eldest kept by his grandfather, youngest lives with his mother. Our Association pays for education of two. Is a hard-working woman, doing her best for her children. Voted £100.

Mrs. —, widow of medical man, has four children. With the help of our Association she is able to provide a home for them. Our Association pays for the education of the youngest. Voted £78.

Mrs. —, widow of medical man, is aged seventy-six and suffers from chronic bronchitis. Unable to obtain old age pension on account of insufficient length of residence in Australia. Voted £65.

Miss —, aged seventy-two, daughter of medical man. Crippled by rheumatism. Voted £63.

Mrs. —, widow of medical man. Receives invalidity pension of one pound per week. No other means. Requested assistance of ten shillings per week to enable her to live in comparative comfort. Voted ten shillings per week.

Mrs. —, Mrs. — and Mrs. —, all widows of medical men and all living in poverty. Have received small sums from time to time.

Dr. —, out of work and unable to obtain any in Australia. Had obtained employment in another State, but had no means of getting there. His wife had gone out working for her living. Voted £19.

It will be seen that the assistance granted is extremely meagre, but it is as liberal as our present means permit and we earnestly appeal for more subscriptions. The

facts in the case of each application for assistance are carefully investigated before any sum is voted by the Council.

(Signed) E. S. LITTLEJOHN,
Honorary Treasurer,
The Medical Benevolent Association
of New South Wales.

August 20, 1928.

THE ALFRED HOSPITAL CLINICAL SOCIETY.

A MEETING OF THE ALFRED HOSPITAL CLINICAL SOCIETY was held at the Alfred Hospital, Melbourne, on June 26, 1928. The meeting took the form of a series of clinical demonstrations.

Scoliosis and Spondylitis of Unknown Origin.

MR. J. LOVE showed a woman, *ætatis* fifty-eight, who had first attended the Alfred Hospital in September, 1926, complaining of pain in the back, of ten years' duration. Forty-four years previously she had suffered from typhoid fever and five years previously she had had an operation on her antrum which still troubled her at times. Examination of the back revealed slight lumbar scoliosis with irregular prominence of the lumbar vertebral spines and definite rigidity of the lumbar spine. The Wassermann test had yielded no reaction. Spinal radiograms revealed a slight degree of scoliosis with a curve convex to the left at the level of the eleventh and twelfth dorsal vertebrae and a curve convex to the right at the level of the second lumbar vertebra. The twelfth dorsal and second lumbar vertebrae both showed an extraordinary degree of rotation and lateral displacement almost to subluxation and the third and fourth lumbar vertebrae were fused together with complete absence of the intervertebral disc, but no destruction of the vertebral bodies. Slight osteoarthritic changes with lipping were noticeable especially on the convexities of the curves. In February, 1927, the patient had been placed in a dextrin jacket with complete relief of pain, but an attempt recently to discard the jacket had led to prompt recurrence. Radiograms taken on June 1, 1928, showed no alteration since the previous X ray examination. Despite the pain and the interference with function induced by the jacket the patient had done heavy work and was the sole support of her family.

Mr. Love was at a loss as to the aetiology of the condition and sought advice as to treatment.

MR. BALCOMBE QUICK suggested that in consideration of the great relief obtained by spinal fixation in a dextrin jacket a fusion operation should be considered.

Bilateral Hydrarthrosis of the Knees.

MR. H. C. COLVILLE showed a girl, *ætatis* nine, who had first attended the Alfred Hospital on January 23, 1928. Nine months previously the right knee had become swollen without apparent cause and had remained swollen since. There had been no pain or disability and all movements had been present. The Wassermann test had yielded no reaction and X ray examination had revealed no abnormality. On March 1, 1928, the joint had been aspirated and clear straw-coloured fluid obtained. The fluid had yielded no growth on culture and a guinea pig inoculation no evidence of tuberculosis. The leg had been splinted in extension, but the fluid had reaccumulated. On April 30 the left knee had suddenly become swollen and on examination had exactly resembled the right. On May 5 following a provocative injection of 0.1 gramme of "Novarsenobillon," the Wassermann test had again yielded no reaction. Past history had been normal except for an illness fifteen months before admission of which the main symptoms were abdominal pain and wasting. Her medical attendant had diagnosed abdominal tuberculosis, but after four months in bed the condition had cleared up and she had put on weight again. None of the stigmata of congenital syphilis was present and the family history did not suggest syphilis. Dr. Colville pointed out that the condition was apparently a classical example of Clutton's joints, but in the absence of stigmata and of the Wasser-

mann reaction, he wondered whether a diagnosis of syphilis was justifiable. Antisyphilitic treatment had not yet been tried.

Dr. F. K. NORRIS said that in his experience stigmata were usually absent in congenital syphilis and that despite the absence of the Wassermann reaction, the condition should be looked on as syphilitic and treated as such. He thought the abdominal symptoms more suggestive of celiac disease than of abdominal tuberculosis.

Mr. R. C. BROWN said that he had seen a similar pair of joints in an adult woman get well with Murphy's glycerine and formalin injections.

Dr. J. F. MACKEDDIE suggested that the condition might be analogous to intermittent hydrarthrosis of adults and would get well without treatment.

Tumours of the Breast.

Mr. A. J. TRINCA showed three patients who suffered from instructive breast conditions.

The first patient, Miss M.G., *atatis* forty-eight, had noticed a small lump in her right breast more than two years previously. She had consulted a medical practitioner who told her not to worry about it. In January of this year she had been admitted to hospital for pleurisy and this lump, about the size of a pea, had been discovered in the axillary tail of the breast by a resident medical officer in the course of an examination of the chest for pleurisy. He had removed a freely movable tumour under local anaesthesia by enucleation and this had been reported on by the pathologist as an innocent tumour. He had noticed at that time that there was an enlarged axillary gland, but had found no evidence of abnormality in the rest of the breast tissue.

In June she had reported at the out-patients' department on account of two lumps in the breast, one underneath the scar of her previous operation and another in the upper outer quadrant nearer the nipple. The former was an enlarged gland and the latter a tumour about two centimetres in diameter having none of the clinical signs of cancer except a questionable adhesion to the skin. On June 12 she had been operated on and the tumour *plus* surrounding breast tissue had been excised and submitted to immediate microscopical examination. This had proved to be active spheroidal carcinoma and a radical operation had then been performed. There had been extensive involvement of the axillary glands including the subclavian and several glands had had to be dissected from the axillary vein. Further microscopical examination had shown that the growth was a subacute spheroidal carcinoma.

The patient had had post-operative deep X ray therapy, but the prognosis was probably hopeless.

Dr. Trinca said that this case illustrated forcibly the potential dangers of apparently innocent tumours in the breast and the dangers and fallacy of the operation of enucleation of such tumours. The distinction between innocent and malignant tumours was not well defined, both might be associated in the same breast and were probably only local expressions of more widespread change.

Dr. Trinca's second patient was a single woman, aged thirty-six years, a waitress, who had reported on May 28, 1928. She had given a history of pain and of a lump in the right breast, noticed for about ten months. She had been advised by three medical men to have an operation on her breast and had been sent to the Alfred Hospital for this purpose. Pain had been worse when she was engaged in her occupation of waitress.

Seven years previously she had had a laparotomy performed and one ovary had been removed and some operation performed on her uterus. Her breasts had both been painful just before menstruation and the lump in the right breast was more noticeable at this time.

On examination there had been a diffuse thickening involving the whole of the upper quadrant of the right breast, nodular on palpation. The left breast showed generalized, but less evident thickening.

Firm pressure had been applied to both breasts by means of wool and bandages and in three days there had been complete relief from pain and distinct diminution in the thickenings. The treatment had been repeated twice weekly with progressive improvement and on June 21, 1928, the bandages had been replaced by a specially fitted

brassière and at the time of the meeting her breasts were apparently normal.

Dr. Trinca said that this was a case of thickening due to abnormal hyperplasia, the result of her occupation in which her breasts, particularly the right, were subjected to continual trauma. In addition there was possibly an endocrine factor the result of ovarian disturbance. It taught the lesson of conservatism in cases of breast thickenings of doubtful nature when the history suggested a possible causative factor in the shape of a traumatic or other stimulus.

Dr. Trinca's third patient was a married woman, aged thirty-one years, who had reported on May 31, 1928, with a history of "lumps" in both breasts for as long as she could remember. She had had severe pain for the previous few months and especially before menstruation. She had been married three years, was anxious to have children, but suffered from dyspareunia. She had no children. She had been told that she had a contracted womb. She had been sent to hospital for removal of the right breast. On examination diffuse thickening of the upper outer quadrant of the right breast and of the upper half of the left breast in a milder degree had been discovered. The treatment adopted had been support as described for Dr. Trinca's second patient. This had been done on two occasions with rapid improvement.

On June 25, 1928, the treatment had been discontinued and a *brassière* ordered.

Dr. Trinca said that this was a case of abnormal hyperplasia, probably due to abnormal endocrine stimulation with disturbance of the balance between secretion and absorption in the breast. It taught the lesson of conservatism in a woman whose history suggested abnormal sex life and ovarian disturbance.

Dr. G. E. FOREMAN said he had seen the second and third patients before and during treatment and would agree with everything Dr. Trinca had said with regard to the diminution and disappearance of the lumps.

New Splint for the Treatment of Fractures of Both Bones of the Forearm.

Dr. W. H. WARD showed a man, *atatis* nineteen, who had fractured both bones of the forearm five centimetres (two inches) above the wrist joint ten weeks previously. The patient had been treated with extension in the mid-prone position on a splint designed by Dr. Ward and the result was functionally and anatomically perfect. No anaesthetic had been used for reduction. Simple extension had reduced the deformity and restored alignment as the muscle spasm was overcome.

Mr. BALCOMBE QUICK, Dr. F. K. NORRIS and Mr. H. C. COLVILLE congratulated Dr. Ward on the excellence of his result, but remarked that in their experience it was better to treat these fractures in full supination, as this movement was most difficult to restore.

Dr. WARD in reply said that the splint could be used for treatment in supination as readily as in the mid-prone position. He had selected the mid-prone position for this patient because on X ray screen examination the bones had appeared to be furthest apart in that position and he was anxious to avoid the risk of cross union.

Diabetes Insipidus.

Dr. J. F. MACKEDDIE showed a patient who had shown typical signs of cerebro-spinal syphilis and *diabetes insipidus* three years previously. She had been treated with mercury and potassium iodide with complete recovery, but had now reappeared with *diabetes mellitus* and peripheral neuritis.

He had seen two patients whose *diabetes mellitus* had followed *diabetes insipidus* and was at a loss to understand the association.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING of the Senate of the University of Sydney was held on August 13, 1928.

The following degree was conferred in person:

Bachelor of Science (ad eundem gradum): Mr. Joseph Bannon, at present carrying out the duties of Radium Emanation Physicist to the Cancer Research Committee.

The following degree was conferred in absentia:

Master of Surgery (Ch.M.): Samuel Stoops Gardiner.

The following appointments were confirmed:

Dr. J. Coen and Dr. A. W. Weißen as Honorary Demonstrators in the Department of Anatomy.

Dr. V. M. Coppleson as Lecturer in Clinical Surgery at Saint Vincent's Hospital.

Dr. W. T. D. Maxwell as Tutor in Clinical Surgery at Saint Vincent's Hospital.

The following appointments to the Honorary Medical Staff of Saint Vincent's Hospital were approved:

Physicians: Dr. H. H. Bullmore, Dr. O. A. Diethelm, Dr. J. P. Tansey and Dr. G. R. P. Hall.

Assistant Physicians: Dr. R. J. Taylor, Dr. M. J. Slaterry, Dr. J. E. Sherwood and Dr. D. Cahalan.

Surgeons: Sir Alexander MacCormick, Dr. J. L. McKelvey, Dr. M. O'Gorman Hughes and Dr. V. M. Coppleson.

Assistant Surgeons: Dr. C. Weston Maher, Dr. W. T. D. Maxwell, Dr. W. H. Perry and Dr. I. D. Miller.

Gynecologists: Dr. Constance D'Arcy, Dr. F. Brown Craig and Dr. F. A. Maguire.

Assistant Gynecologists: Dr. D. S. Foy, Dr. C. Coghlan and Dr. M. B. Fraser.

Ophthalmic Surgeon: Dr. F. G. A. Pockley.

Assistant Ophthalmic Surgeons: Dr. F. J. Blaxland, Dr. H. O. Maher, Dr. A. L. North and Dr. F. A. Weisener.

Pathologist: Dr. L. Utz.

Assistant Pathologist: Dr. A. J. Fitzgerald.

Dermatologist: Dr. Langlois Johnston.

Assistant Dermatologists: Dr. G. Norrie, Dr. G. Lindeman and Dr. W. E. Ryan.

Surgeon for Ear, Nose and Throat: Dr. H. S. Marsh.

Assistant Surgeons for Ear, Nose and Throat: Dr. J. J. Woodburn, Dr. A. E. H. Brady, Dr. W. R. Beavis, Dr. W. B. Harwood and Dr. H. S. Kirkland.

Skiagraphist: Dr. B. J. Harrison.

Assistant Skiagraphist: Dr. B. P. Anderson-Stuart.

Orthopaedic Surgeon: Dr. D. J. Glissan.

Anesthetists: Dr. H. Hunter, Dr. J. D. Maude, Dr. R. Jeremy, Dr. J. Hughes, Dr. G. J. Duncan, Dr. R. A. Müller and Dr. H. A. Sweetapple.

Psychiatrist: Dr. W. R. Page.

The Dean of the Faculty of Dentistry of the North Western University of Chicago advised that the Faculty Committee of his University had decided to award three Tuition Scholarships to be made available annually for graduates of the Dental Schools of Sydney, Melbourne and Adelaide Universities. It was decided to convey thanks to the North Western University of Chicago for its generosity in this connexion.

Professor W. F. Osborne, of the University of Manitoba, submitted an invitation from the Canadian Council of Education for the University to appoint a delegate to attend the Fourth National Conference on Education to be held in Vancouver in April, 1929. The Vice-Chancellor was authorized to nominate a suitable representative.

On the recommendation of the examiners, it was resolved to confer upon Mr. Ian Clunies Ross, B.V.Sc., the degree of Doctor of Veterinary Science (D.V.Sc.), for his thesis entitled "Observations on the Hydatid Parasite, *Echinococcus granulosus* (Batch 1786), *Rudolphi*, 1805," and "The Control of Hydatid Disease in Australia." Sir Arnold Theiler (one of the examiners) reported that he considered "the thesis and the publications as good evidence that the applicant possesses qualities of a careful research worker." Dr. N. Hamilton Fairley (another examiner) expressed the opinion that "the thesis constitutes the most important individual contribution yet made on the prevention of hydatid disease in Australia."

Since 1925 Mr. Clunies Ross has been Lecturer in Veterinary Parasitology in the School of Veterinary Science and at present occupies the position of Research Officer in Veterinary Parasitology to the Council for Scientific and Industrial Research.

Correspondence.

CHOLESTERIN CRYSTALS IN A HYDROCELE SAC.

SIR: An old man, aged about sixty-five, has been tapped by me for left hydrocele with the following results.

On July 19, 1921, seven ounces clear yellow fluid.

On March 22, 1922, twenty-four ounces clear yellow fluid, specific gravity 1.020.

On March 23, 1923, twenty-three ounces clear yellow fluid, specific gravity 1.010.

On August 16, 1928, twenty-three ounces of yellow fluid, almost opaque, with a peculiar shimmering, oily appearance, no alteration on standing. On examination under microscope the fields were full of typical cholesterol crystals. The total amount of cholesterol must therefore have been very great.

The fluid on each occasion, on boiling, became solid with albumin. The patient told me that after the 1923 tapping there had been no swelling or discomfort, so that it does not appear that any hæmorrhage had been caused.

It is also noticeable that the interval between the last two tapplings has been a long one and the sac has taken a long time to refill. The references to hydrocele fluid in the books at my disposal mention occasional occurrence of cholesterol in small quantity, probably derived from blood in the sac.

It may therefore be of interest to record a case where the crystals were in such quantity as to cause opacity, and where there does not appear to have been any antecedent hæmorrhage.

Yours, etc.,

F. A. RODWAY.

Nowra.

August 28, 1928.

AGOMENSIN AND SISTOMENSIN.

OUR attention has recently been directed to an unfortunate error in an advertisement published in our columns on March 10, 1928. The description of the pharmacological action of "Agomensin Ciba" was set out under the heading of "Sistomensin" and the description belonging to the latter preparations was appended to the caption of "Agomensin." Readers interested in these preparations will find the corrected version in the advertising pages of the issue of THE MEDICAL JOURNAL OF AUSTRALIA of August 18, 1928. Mention should be made of the fact that the action attributed to these two preparations is based on carefully conducted and controlled physiological experiments.

Obituary.

ROBERT ANDREW STIRLING.

WE regret to announce the death of Dr. Robert Andrew Stirling which occurred at Melbourne on August 23, 1928.

FRANCIS LAWRENCE BIGNELL.

WE announce with regret the death of Dr. Francis Lawrence Bignell which occurred at Lismore, New South Wales, on August 27, 1928.

ALBERT ALEXANDER PARRY.

WE regret to announce the death of Dr. Albert Alexander Parry which occurred at Rockhampton, Queensland, on August 28, 1928.

Corrigendum.

A MISTAKE was made in our issue of last week in the numbering of illustrations to the article by Dr. Reginald Webster. The legend under Figure IX should have appeared under the illustration marked Figure X and *vice versa*.

Books Received.

- DEAFNESS AND ITS ALLEVIATION, by Vincent Nesfield, F.R.C.S.; 1928. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 90, with illustrations. Price: 7s. 6d. net.
- POSSIBLE WORLDS AND OTHER ESSAYS, by J. B. S. Haldane; 1927. London: Chatto and Windus; Sydney: Angus and Robertson, Limited. Crown 8vo., pp. 320. Price: 10s. net.
- THE GENESIS OF EPIDEMICS AND THE NATURAL HISTORY OF DISEASE, by Clifford Allchin Gill, M.R.C.S. (England), L.R.C.P. (London), D.P.H. (England), D.T.M. & H. (England); 1928. London: Baillière, Tindall and Cox. Royal 8vo., pp. 576. Price: 21s. net.

Diary for the Month.

- SEPT. 11.—Tasmanian Branch, B.M.A.: Branch.
- SEPT. 11.—New South Wales Branch, B.M.A.: Ethics Committee.
- SEPT. 12.—New South Wales Branch, B.M.A.: Nomination of Candidates for Federal Committee.
- SEPT. 13.—Victorian Branch, B.M.A.: Council.
- SEPT. 13.—New South Wales Branch, B.M.A.: Clinical Meeting.
- SEPT. 14.—Queensland Branch, B.M.A.: Council.
- SEPT. 17.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- SEPT. 18.—Tasmanian Branch, B.M.A.: Council.
- SEPT. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- SEPT. 19.—Western Australian Branch, B.M.A.: Branch.
- SEPT. 19.—Central Northern Medical Association, New South Wales.
- SEPT. 19.—Western Medical Association (Bathurst), New South Wales.
- SEPT. 19.—Section of Obstetrics and Gynaecology, New South Wales Branch, B.M.A.
- SEPT. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- SEPT. 26.—Victorian Branch, B.M.A.: Council.
- SEPT. 27.—New South Wales Branch, B.M.A.: Election of Members to Federal Committee.
- SEPT. 27.—South Australian Branch, B.M.A.: Branch.
- SEPT. 28.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. Noel Tracey Bull (B.M.A.) has been appointed Certifying Medical Practitioner at Heathcote, Victoria.

Dr. Albert John William Philpott (B.M.A.) has been appointed Deputy Inspector-General of the Insane, Victoria.

Dr. C. G. McDonald (B.M.A.) has been appointed Honorary Consulting Physician at the Marrickville District Hospital, Sydney.

Dr. A. Lynton Clowes (B.M.A.) has been appointed Honorary Consulting Aurist at the Marrickville District Hospital, Sydney.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

- ADELAIDE CHILDREN'S HOSPITAL (INCORPORATED): Medical Superintendent and Resident Pathologist.
- AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Junior Resident Medical Officer.
- LAUNCESTON PUBLIC HOSPITAL: Junior Resident Medical Officer (Male).
- MARRICKVILLE DISTRICT HOSPITAL: Resident Medical Officers.
- THE PUBLIC SERVICE BOARD, NEW SOUTH WALES: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. Marrickville United Friendly Societies' Dispensary. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

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